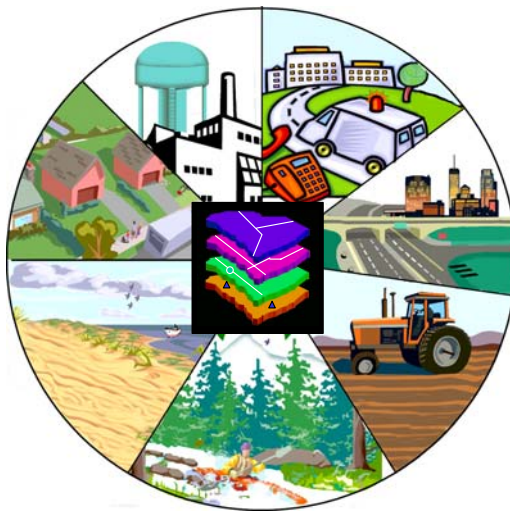


Preliminary Final Draft

IMPLEMENTATION PLAN FOR THE OREGON STATEWIDE GIS UTILITY



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January 16, 2006

PREFACE

This implementation plan is one of a series of reports that define requirements, a technical and institutional design, and implementation approach for development and ongoing operation of the GIS Utility. The implementation tasks and timing described here draw on information and recommendations in previous project reports including:

GIS Utility Report (Project Deliverable Number and Name)	Report Date	Description
Technology and Geographic Data Inventory Report		Compiled results of statewide survey on status of GIS technology and geographic data use.
Technology and Geographic Data Gap Analysis		Evaluation of technology and data status among the statewide user community and observations of needs and gaps relative to full realization of GIS Utility goals.
Data Stewardship Best Practices		Discussion of roles and recommendations for setting up an effective environment for ongoing geographic data maintenance and exchange.
Conceptual Design		Conceptual “blueprint” describing the structure of the GIS Utility. Addresses all elements of the GIS Utility initiative including the system configuration, data content and design, and the governance/organizational structure.
GIS Utility Case Studies Working Paper		Provides an overview of the important elements of an effective GIS Utility and Web-based geographic data portal. It identifies and explains other similar efforts at the national and international level. It also includes a directory of GIS and related Web services at the local, regional, and state level in Oregon.
Risk Identification and Mitigation Plan		Identifies the major organizational and technical risks to be confronted in GIS Utility development and provides observations on strategies for avoiding risks or mitigating their impacts.
GIS Utility Business Case		Discussion of the purpose and justification for the GIS Utility with a full description of the user community and the business requirements for the GIS Utility. It also includes the results of a rigorous cost-benefit analysis that defines potential long-term financial and non-financial benefits to Oregon users.

Please refer to these reports for more details about concepts and design elements referenced in this implementation plan

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SECTION 1 INTRODUCTION

1.1 WHAT IS THE GIS UTILITY

Oregon's GIS Utility, called "navigatOR," is a shorthand reference to the institutional and technical environment that provides for the accelerated development, assured maintenance, and effective sharing of foundational, location-based information for the public and nonpublic sector user community in Oregon. navigatOR will support a wide range of important programs and business requirements at the state, regional, and local levels, including management of natural resources, infrastructure and asset management, social services, public safety, and economic development. Broad participation, responsive governance, appropriate technology and adequate human resources characterize the navigatOR initiative. It will leverage past, present and future investments by enabling frequent reuse through reliable discovery and appropriate access, thus benefiting all Oregon citizens.

The Oregon Geospatial Enterprise Office (GEO) of Oregon's Information Resource Management Division (IRMD) is developing the navigatOR initiative. Currently, the initiative is in Phase 1, which includes the development of a business case and a design and plan for subsequent development and operations. PlanGraphics, Inc. was hired to assist GEO in the Phase 1 activities.

The overall goal of the navigatOR initiative is to create a technical and organizational structure, with necessary administrative and operational policies and procedures to:

- Accelerate the full completion of Oregon geospatial Framework data for the entire state
- Encourage and support geographic data sharing and access for a broad community of users throughout Oregon, including all levels of government, the private sector, not-for-profit organizations, and the general public
- Provide an efficient environment and tools to support ongoing update of Framework geographic data
- Provide easily accessible services for geographic data searching and query, GIS data access and download, and basic mapping.

As described in more detail in the *GIS Utility Conceptual Design*, the following principles will guide design and development:

- Existing Systems: Make effective use of and build on existing hardware, networks, and data sources.

- Core and Distributed Components: Support distributed data access (at custodian sites) to the greatest extent possible, but provide for centralization where it makes best use of available networks, resources, and the roles of data custodians.
- Regional Resource Centers: Foster development of regional GIS service centers to support users in specific regions of the state, particularly small counties and cities without the resources to develop and sustain in-house GIS programs.
- Framework Data Prioritization: Provide a clear definition of data theme content, accuracy, and format, and a priority (importance for a broad user community) to each Framework element.
- Software Use: Use ESRI software as the foundation for GIS database management but employ practical standards.
- Core Services: A limited set of core services hosted by the GIS Utility's management unit will concentrate on data management, data stewardship, data/metadata access, and a limited suite of enterprise solutions. The design should not preclude additional value-added hosted applications.
- Portal Interface: Data and services should be accessible by a standard, menu-based Web portal with defined choices for search and access of data and other data management functions with opportunities for expansion to provide more sophisticated data searching.
- State Data Center: House core navigatOR systems in the new State Data Center, and make use of its network links, system security, and resources for system operation, business continuity and disaster recovery.
- Web-based Access: Design and develop an intuitive, Web-based menu interface for data query and access applications. Use industry standards. Establish links with other GIS portals, and where appropriate, build Web-based functionality to integrate information from other GIS portals in services offered by navigatOR.
- Standards Adherence: Define and adhere to a clear set of data content and format standards. This includes standards approved by OGIC and other applicable data standards (e.g., FGDC). Adopt a policy that encourages full standards compliance for Framework data included in navigatOR, but establish a minimal level of initial compliance for inclusion.
- Organizational Structure: Create an organizational structure that includes a strong governing board to provide leadership, set policies, and oversee the initiative, a well-resourced management unit (initially in the Geospatial Enterprise Office), and other organizational elements that support wide coordination and information sharing among a large user community.

As currently envisioned (and further described in the *Conceptual Design*), the GIS Utility will include the main components portrayed in Figure 1-1 and explained in Table 1-1.

Figure 1-1: navigatOR System Configuration

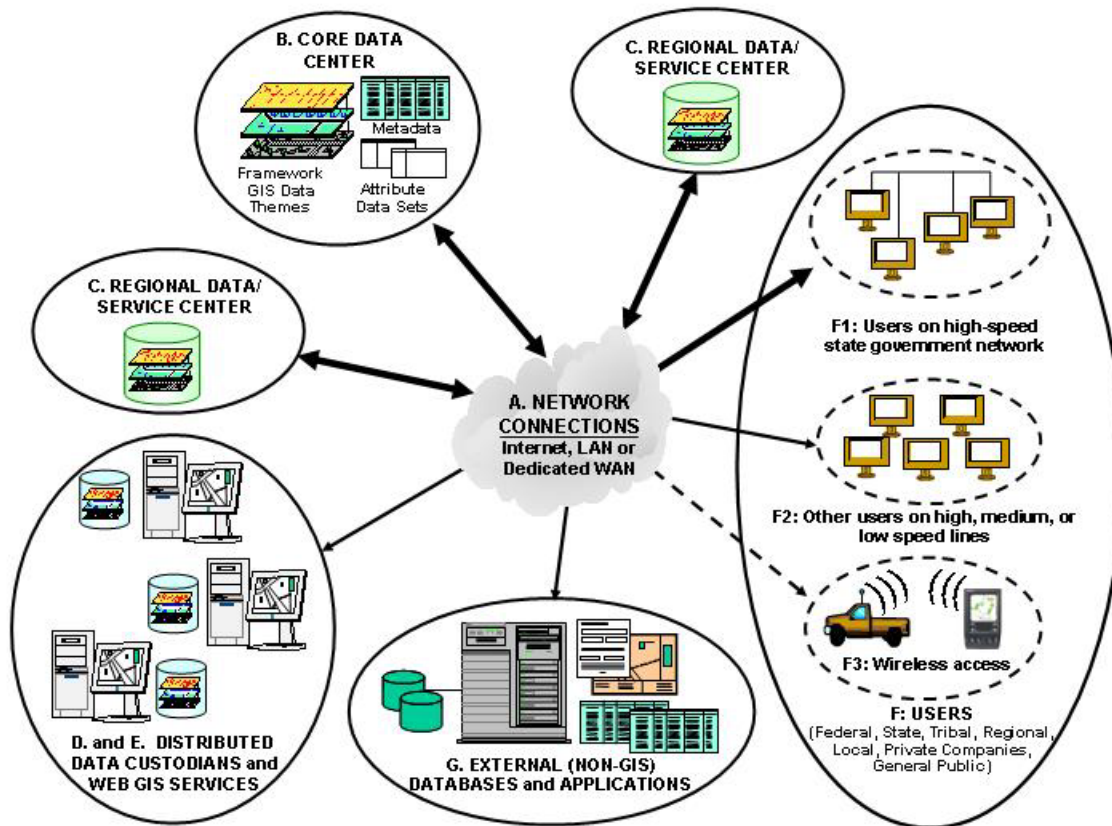


Table 1-1: Main Components of the navigatOR System Configuration

A: Network Connections	This "virtual component" conveys the idea that navigatOR will make use of all available network links in the state. This includes access by existing dedicated local and wide area communications (e.g., state government network) and all other services allowing Internet communications for users inside and outside the state.
B. Core GIS Utility Data/Service Center	The main "hub" for GIS data and services operated by navigatOR Management Unit (IRMD-GEO). The Core Center will store and host selected Framework data and metadata for all Framework data for Web-based access for all participants. Basic services for data management and quality assurance, data search, query and access, basic map display, and other services that support access to Framework data. The Center will also serve as a directory of GIS resources and distributed sites. It will include server and storage hardware, GIS and database management software, and important system management software necessary for sound system and database administration and security.

Table 1-1: Main Components of the navigatOR System Configuration (continued)

C. Regional GIS Utility Centers	Regional Centers will host data and GIS services for users in a selected geographic area. The Regional Centers play several roles that are also played by the Core Data/Service Center: a) maximize network bandwidth for remote users by locating data closer and providing more convenient network links to users in the region, b) provide an option for local hosting of GIS services (beyond data management) for low-resourced counties and cities that need GIS capabilities, c) provide generally available technical support to GIS users, d) support effective local data maintenance, and e) support overall state goals to extend technology access to underserved areas of the state. This Implementation Plan identifies a total of four Regional Centers (specific location or administering organization not yet identified). The actual number of sites put in place through Phase 4 may be different depending on the evolution of needs and participation levels.
D. GIS Data Custodian Sites	Designated stewards—those organizations that have a lead responsibility for collecting data and original source material—will perform the majority of Framework data update and maintenance. This includes multiple federal and state agencies, local government departments, utility companies, and other participants. For some themes, data may be uploaded to the Core Data Center for hosting, but the steward will manage other data sets with access provided at their sites.
E. Distributed Web-based GIS Sites	Distributed Web-based services, maintained and operated by participating organizations (public sector and non-public sector), which will allow access to data and GIS services. navigatOR will enable direct links and, subject to security controls, transparent access to GIS data stored at these sites. GIS software and middleware will make the link transparent.
F. GIS Utility Users:	The broad user community includes any public sector or non-public sector organization or member of the public that chooses to participate.
F1. State Government Users on High-Speed Network	State agency users, most of whom have direct, high-speed access through the state's digital network. Most state agency users will be connected to a local area network with a router that connects to the state statewide Area Network. Their configuration will allow high-speed intranet Web-based access to the Core Data Center and Internet Web access to external sites.
F2. Other Users	Includes all participating public sector organizations (federal, tribal, regional agencies, special districts, local governments, and public universities), private companies and the general public with Web connections for access to the Core Data Center, Regional Resource Centers, or Distributed Sites (E) maintained by participants. These users will access navigatOR data and services using any available communication services, including dial-up in some cases.
F3. Wireless Access	In the future, navigatOR will support field and mobile data access through wireless data communications from vehicle-based computers or portable/hand-held devices. The availability and speed of wireless communications will be very dependent on service providers in specific geographic areas but the overall trend is for wireless communications to become more ubiquitous and faster.
G. External Databases and Applications	Access will be provided to and from non-GIS databases and applications that require geographically referenced data or specific services to geographically enable those external systems. The nature of the access may range from data download to more interactive data and application integration.

1.2 BUSINESS CASE FOR NAVIGATOR DEPLOYMENT

As part of the planning and design for navigatOR, the Geospatial Enterprise Office carried out an evaluation of business requirements and benefits. The results of this evaluation are fully documented in the *Business Case for the Development of a Statewide GIS Utility*. This document makes a strong case for proceeding with development and deployment. A summary of the key findings are provided below:

Public agencies and non-governmental organizations in Oregon depend on maps and geographically referenced information to support day-to-day operations and longer-term planning and decision-making. Despite substantial, ongoing investments in geographic information and GIS technology in the state, users and potential users continue to experience limited access to important GIS information or the technology to use it. In fact, at least 80 percent of the information collected and managed by governmental bodies is geographic in nature, that is, the information has some locational key such as address, road segment, map coordinate, or district identifier. In summary:

- Multi-jurisdiction geographic information management can be more efficient and better coordinated.
- Organizations can more fully capitalize on past and current investments in GIS.
- Considerable redundancy and duplication in data collection, data maintenance, data storage, and system resources across and within organizations can be reduced. Simultaneously, data maintenance planning and activities can allow programs to be more effective in satisfying their mandates.
- Complete, high-quality geographic data is incomplete and data quality will not allow all broad-based user needs and citizen expectations to be met.
- Procedures, standards, and stewardship practices for effective maintenance of regional and local GIS data can be improved.
- Access to data and technology can be more consistent, with less regional disparity.
- Opportunities for leveraging outside funds can be more fully explored and realized.

For a wide range of programs and projects, staff and program managers spend a considerable amount of time just gathering or pulling together information from a wide range of sources. Geographic information is hard to find, access, and integrate in a manner that makes it useful to those who need it, when they need it.

The problem is rooted largely in policy and organizational procedure and not, as commonly assumed, in technical hurdles. Administrative barriers, poorly defined management authority, problems in allocating and using available funding, and inadequate management controls have resulted in missed opportunities, duplication of

resources and effort, and inconsistencies in data format and quality, which inhibit the use of valuable geographic data and complicate ongoing data maintenance processes.

The proposed navigatOR development is supported by a sound business case showing substantial, ongoing benefits for public agencies, private companies, and the general public. This Business Case documents a clear, long-term return on investment, as well as significant non-financial benefits that will improve operations, delivery of services, and the effectiveness of public agency programs at the state, regional, and local level. As explained in this *Business Case*, navigatOR development is based on the following key benefits and outcomes:

- Staff efficiency/productivity increases which, when measured in monetary terms, can result in annual savings of over \$80 million dollars for state agencies and at least \$100 million for city and county governments throughout the state when navigatOR is fully deployed
- Opportunities for actual cost savings and revenue enhancement (increase) of well over \$80 million over a ten-year period
- Greatly increased opportunities for securing outside funds for GIS development and related technology projects statewide
- Tangible, non-financial benefits resulting in robust information security, improved quality of service, enhanced emergency preparedness and public safety, responsiveness to needs of Oregon citizens and businesses, and better management of the state's environment and infrastructure
- Support for state-regional-local collaboration and the extension of information technology capabilities to currently underserved jurisdictions
- Stimulus for economic and business development and public-private partnerships

In summary, the GIS Utility program:

- Addresses important business needs of a large, statewide community of users
- Will deliver substantial financial and non-financial benefits in the short-term and long-term
- Will build and capitalize on existing networks, systems, and geographic data investments
- Can be largely supported by a better management and leveraging of current state, federal, and local expenditures for geographic information data and technology

1.3 PURPOSE OF THIS PLAN

This Implementation Plan is a guide for the development and deployment of the GIS Utility. It provides a “strategic foundation,” that is, a long-term context for all the detailed aspects of a multi-year implementation process. This Plan identifies the tasks and schedule for development and identifies responsibilities for accomplishing these tasks.

1.4 CURRENT GIS USE AND COORDINATION IN OREGON

GIS technology has been used at the state and local level in Oregon for about 25 years. Several local and regional agencies pioneered the use of GIS in the early 1980s and laid a foundation for very successful GIS applications in the larger local governments, and many state agencies are active users of GIS. In 1983, the State Map Advisory Council (SMAC) was directed by Executive Order No. EO-83-15 to coordinate mapping, land records management, and geographic information activities. In 1989, SMAC was asked to provide direction to the State Service Center for Geographic Information Systems created by Order EO-89-16. A major step was taken in 1994, when the Oregon Geographic Information Council (OGIC) was created. OGIC was given a broader scope to support GIS coordination for state agencies and continues to operate effectively today. OGIC acts as an advisory body, providing input and oversight for GIS coordination at the state level. OGIC has approved the work of several subgroups (Framework Implementation Team, Standards Committee) to support GIS development and implementation work.

Almost every state agency in Oregon has mission objectives and programs that depend on geographic information to be successful and 16 of these agencies already have active GIS programs. At least 12 federal agencies operating in Oregon have active GIS programs and many of these produce geographic data useful to state and local agencies. There is also a large amount of interest and activity at the regional and local level in the use of GIS technology, but lack of data and resource limitation often has negative impacts on technology access.

Currently, the Geospatial Enterprise Office (GEO) in the DAS/IRMD performs administrative and operational duties for statewide GIS. GEO includes the statewide GIS Coordinator and a small team. GEO was responsible for the preparation of a strategic plan for geographic information coordination in 2001, which has provided further direction for GIS programs in Oregon.

Since 2000, GEO has operated the Oregon Geospatial Data Clearinghouse (OGDC), which provides statewide GIS data, via the Web, to the user community. This clearinghouse (www.oregon.gov/DAS/IRMD/GEO/sdlibrary.shtml) begins to address one objective of the GIS Utility: the provision of readily accessible geographic information to the user community. However, currently it contains only geographic data

of limited usefulness, with several key data sets out-of-date or incomplete, which prevents the business needs of state, regional, and local users from being fully satisfied.

The current organizational and resourcing structure in Oregon has made significant accomplishments in GIS development and coordination. But the current structure is not sufficient to drive and oversee full development of Framework data, to extend GIS technology access statewide, and to integrate geographic information into general business processes in state, regional, and local governments.

1.5 CURRENT AND ANTICIPATED GIS USE AND COORDINATION

In order to visualize goals for the GIS Utility, it is useful to compare the current GIS coordination environment with that which is proposed for the GIS Utility. Table 1-2 provides this comparison for several key technical and institutional factors. This table basically says that while the current environment is working to support GIS use and development, navigatOR will accelerate development, provide major improvements in data quality and services, resulting in more extensive benefits and enabling more comprehensive access by users.

**Table 1-2: NavigatOR: The Oregon GIS Utility—
Current State of GIS Coordination and Changes for the Future**

A picture of the current state and what navigatOR offers for improved resources, coordination, and integration of geographic data and GIS technology access for the user community in Oregon.

Characteristic/ Feature	Current State	Future State (navigatOR)	Mechanism to Enable Change
Integration of GIS Technologies in Enterprise Process	• Use of GIS technology and access to spatial data uneven across and within levels of government. • Many government agencies (at all levels) are underserved. • Regions of the state, especially in the east and south, are technologically lagging.	Integration of GIS in all levels of enterprise business activities will be phased in. Includes many effective technical approaches including: • Web-based applications using Framework datasets as foundation • Server-based GIS applications and services with Web-based access • Geographic query and analysis functions “embedded” into or transparently accessed by other applications (not requiring user access to GIS software) • Easy access to geographic data by multiple applications and geographic-enabling of nonspatial databases • Regional Resource Centers encourage coordinated integration with local and regional systems	• Investment of political capital and financial resources toward the creation of navigatOR by executive and legislative leaders at all levels of government. • Creation of Regional Resource Centers. • Formal adoption of enterprise IT/GIS principles and practices • Collaborative development of navigatOR strategic plan and action plans.
Cooperation and Collaboration in GIS Projects	• Participation in cooperative/collaborative GIS development is good. However, most efforts are ad hoc, opportunistic, and limited to short-term projects or focused on specific program areas.	• Extensive and integrated administrative framework exists to support collaborative and cooperative GIS project development and execution. • Set of effective policies, legal instruments, administrative practices, and project management procedures and tools to encourage and support collaboration and partnerships • Direct management and technical support to help parties organize and execute joint efforts and to meet requirements for standards that support information and technology sharing	• Further development of relationships/partnerships. Acceptance of collaboration and cooperation model for positive participation in governance structure. • Development of specific tools, instruments, and administrative procedures • Possible changes to, or new, policies and legislation that better supports and lends incentives for collaboration and partnerships
Governance and Organizational Structure	• Organizational framework is voluntary without strong lines of authority or policies. • Biennial administrative fee supports coordination office (GEO) with small staff and some Framework data development. • Limited authority to initiate changes in support of true enterprise GIS.	• Enterprise activity recognizes the fundamental importance of location in decision-making. • Governance/organizational structures support data and administrative interactions across “enterprise.” • Data collection and maintenance efforts are coordinated through the efforts of an expanded staff resource. • All framework activity is supported financially and politically.	• Executive authority for a strong governing Board with equitable representation from state, federal, regional, tribal, local levels. • Formal governance structure that includes other organizational entities under the Governing Board and set of formal policies • Authority vested with Board to coordinate all government geospatial investments.

**Table 1-2: NavigatOR: The Oregon GIS Utility—
Current State of GIS Coordination and Changes for the Future (continued)**

Characteristic/ Feature	Current State	Future State (navigatOR)	Mechanism to Enable Change
Geographic Data Coverage and Quality	- Statewide coverage for most Framework themes does not exist. - Several data development programs have been initiated but are progressing, in most cases, slowly. - Quality and currency of data is moderate to poor for most Framework themes - There are insufficient incentives and/or resources to collaborate and cooperate in the statewide database development	- All Framework data themes are created statewide and at the appropriate scale for the Oregon user community. - All Framework data themes are managed as critical assets with an effective stewardship program for ongoing maintenance and management - Coverage of Framework data is much more consistent statewide - Overall data quality remains high through effective QC and QA procedures and tools	- More detailed data model, design and technical specifications for Framework data - More detailed identification or responsibilities for data stewardship and management of data conversion - Formal program and plan for Framework data development with clear funding relationships and responsibility
Geographic Data Maintenance	- For most Framework data themes, systematic maintenance programs for update and maintenance are not in place. - Stewardship roles not well defined - Effective procedures and tools for ongoing data update are generally not in place for most data themes	- All Framework data are consistently and systematically maintained for statewide application. - Clear set of procedures and tools for update and posting of data are in place - Local and federal participation in maintenance and stewardship activities are encouraged and enabled - Metadata are always generated for data sets and any data maintenance updates. - Robust practices and systems in place to support database administration and monitoring including back-up, disaster recovery	- Clear set of formally approved standards and assigned responsibilities for data update, quality assurance - Procedures for timely update and posting of data are implemented - Effective applications to facilitate update and quality control/quality assurance and posting of Framework data
Access to Geographic Data	- The Oregon Geospatial Data Clearinghouse (OGDC) provides Web-based access to baseline geospatial data. - Some limitations in data use because of format and coordinate system problems - Some local government and regional data suppliers provide Web accessible data but no general access to local data across the state - Local and regional data providers have varying policies and legal/financial requirements for data access	- More robust Web-based portal allowing access to wider range of geographic data with more user friendly environment - Effective links to data custodians and integrators around the state to increase the type and quality of data available - Regional Resource Centers providing convenient support for users in specific areas of state	- Better understanding of the enterprise-oriented "business of government" through collaborative development of the Oregon Geographic Information Board. - Incorporation of GIS functionality in e-Gov solutions for enterprise business processes

**Table 1-2: NavigatOR: The Oregon GIS Utility—
Current State of GIS Coordination and Changes for the Future (continued)**

Characteristic/ Feature	Current State	Future State (navigatOR)	Mechanism to Enable Change
Web-based Services	The provision of government services through the Internet and Intranet is growing. These services include spatial analyses, routing problems, and locate businesses and properties in a simple manner using a generic web browser. GEO's website links to a graphical window for displaying spatial data.	- Improved Web-based portal with more user-friendly services - Adherence to emerging Web-based standards and search functionality - Increased adoption of Web-based server-centric model for Internet and Intranet access and move away from need for desktop licenses of GIS software	- Adoption of standards for Web portal development and ongoing support. - Data licensing and data privacy concerns must be resolved systematically - navigatOR Governing Board must be able to establish and enforce policies in these areas
Integration with External Systems and Databases	- The limited understanding of the business role of "geographic data" across government agencies makes it difficult to estimate the current state of the integration of GIS with external systems and databases - But many agencies see value of locational identifiers as a means to integration - Interest growing in moving toward a more formal "enterprise IT architecture" in state government with GIS as a major component	- Ongoing design and development will include focus on opportunities for integration through wise definition of data formats and common data keys - Encourage all IT and GIS development projects to explore means to geographically enable all systems, with technical support to find best ways to integrate or embed GIS data or functionality with "external" systems	- Appropriate measure of which external systems/databases should be linked to existing/proposed Framework themes - Collaborative development of implementation plan for integration efforts
Funding and Resource Availability	- Current state agency support for GEO and coordinated data development is helpful but inadequate to build effective enterprise GIS environment - Multiple federal, state, and local agencies spend large amounts of money on GIS technology and data, but effective channeling of these funds is poor and not contributing directly to a coordinated statewide GIS environment - Multiple funding mechanisms at state level: - DAS-managed administrative fee - Legislation (like ORMAP and OEM) - Legislative Emergency Board grant - License fees for data access	- A governance structure that will stabilize financial and administrative commitment to geospatial data technologies and resources - Linking of navigatOR goals to enterprise IT programs and initiatives to make more effective use of existing and future funds - Additional funds to be leveraged through cooperative data development agreements and partnerships, as well as collaborative short- and long-term planning and budgeting - Process and commitment to pursue and achieve funding from "non-traditional" sources - Substantially improved partnerships for the maintenance and distribution of geospatial data resources are established	- Baseline investments in GIS data and services are established and widely accepted - Geospatial investments at all levels are leveraged to implement collaboratively developed navigatOR strategy - Accounting mechanism in place to capture efficiencies directly attributable to navigatOR - Implementation plan for metrics mirrors developmental plan for navigatOR (multiple phases)

**Table 1-2: NavigatOR: The Oregon GIS Utility—
Current State of GIS Coordination and Changes for the Future (continued)**

Characteristic/ Feature	Current State	Future State (navigatOR)	Mechanism to Enable Change
Core Management and Support to Users	General recognition in many agencies and organizations regarding value of GIS technology and data, but administrative environments tend to be oriented toward distributed authority as it relates to specific programs and mandates, not statewide information management efforts	- Governing Board with participation and/or active support of senior officials - Governance elements that include technical, policy, and user input - Support and build on the state's commitment to enterprise activity as it relates to geospatial data and data technologies. - Effective education and outreach programs aimed at senior management and at users - Ongoing support from GEO & Regional Resource Centers	- Funding and resource support for staff positions required implementing the navigatOR concept - Organizational support for the creation of distribution mechanisms related to geospatial data and technological expertise - Authority for siting of, and staff training at, regional resource centers

SECTION 2 STRATEGIC FOUNDATION AND STRUCTURE

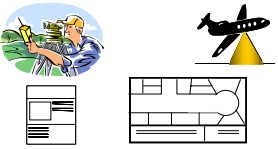
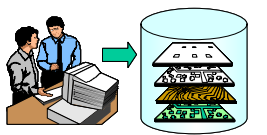
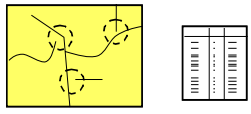
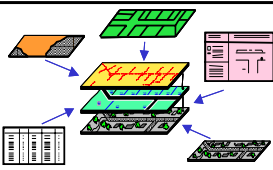
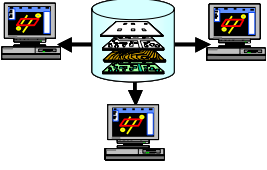
2.1 GIS UTILITY PARTICIPANTS

A fundamental concept of navigatOR is that it will serve the needs of users statewide in all the public and non-public sectors. The user community is broad and includes the following types of organizations and user groups:

Federal agencies	Federal agencies have major roles in managing land in Oregon and providing services that require geographic information. At least 12 federal agencies are already actively involved in GIS activities. Among these are: Bureau of Land Management, U.S. Forest Service, Bureau of Indian Affairs, Farm Services Agency, U.S. Department of Transportation, and the Bonneville Power Administration
State agencies	State agencies have a range of responsibilities for managing or monitoring land, administering programs, and providing services to a dispersed population throughout Oregon. Almost all of the approximately 40 state agencies have some use for geographic data and over 15 are currently making active use of GIS technology and data.
Local governments (cities and counties)	Oregon has 36 counties and 240 cities (45 of which are over 10,000 in population). The large range of planning, management, and services functions that local governments provide makes geographic data and technology essential. Most of the counties and larger cities are already making some use of GIS and interest is very high for expanded access to data and technology tools.
Tribal governments	There are 10 federally recognized tribes in Oregon, with five reservations comprising approximately 1200 square miles. The 2005 statewide survey showed that 5 of these currently have active GIS programs. Tribal governments have many (if not all) of the same land management and operational responsibilities as local governments and therefore have an important need for maps, geographic information, and GIS technology. Use of geographic data and GIS technology is growing among Tribal organizations
Regional agencies and special districts	There are over 700 separate regional public entities, independent or quasi-independent from local or state governments, which have specific jurisdiction over an area of land. These include such organizations as Councils of Government, Portland Metro, School Districts, and Watershed Councils. Each has a specific set of responsibilities for planning, land or resource management, infrastructure management, or the provision of services.
Academic and research communities	Universities and research organizations (public and private groups) provide educational services and support research in which geographic data is important. In many cases, these institutions house special institutes or programs that collect geographic information or play an r ole in data distribution.
Public and private utility companies	Several hundred organizations operate in Oregon to provide consumers with utility services (water, electric, sewer, gas, CableTV, telephone). These include private investor-owned companies, co-operatives, and public utility districts. All have important business needs for geographic data to support day-to-day operations and long-term planning.
Private sector companies	Large and small businesses in Oregon provide a large range of products and services; develop natural resources, and play an important role in distribution of goods. This includes "knowledge-based" based industries providing information-related services and products. Geographic information is of growing importance for these companies
Not-for-profit organizations and citizen groups	Citizen groups or not-for profit organizations that have a public advocacy role or specific professional or economic development role are important users of geographic information and GIS technology at the statewide and local level in Oregon.
General public	Any individual member of the public—including residents and visitors to Oregon will have Web-based access to geographic information in a format consistent with their needs.

Each of these participating organizations will play one or more roles in navigatOR. Many will simply be users of data and navigatOR portal services, but others will play important roles in providing data sources, performing database update and quality control, integrating data from different sources, providing Web-based data and services to users, and providing system administration to support services for ongoing operations. These data stewardship roles are extremely important to navigatOR and are explained in detail in the *GIS Utility Geographic Data Stewardship Best Practices* report. An excerpt from that report elaborates on these data stewardship roles (see Table 2-1).

Table 2-1: Data Stewardship Roles

	Produce and Provide Source Material or Data	Collection or compiling of data or records in digital or hard copy form which are the primary sources in the creation or update of a GIS database. This covers a range of sources that depend on the particular data element and organization responsible. Sources could include orthoimagery, GPS-based field data, inspection of inventory forms, etc.
	GIS Database Update	Modifying an existing GIS database, (using map and database editing or data import tools, and acceptable source material, to reflect actual real world changes. Ideally, updating procedures and timing follows specific rules that vary for different data elements.
	GIS Data Quality Assurance	Automated and manual checks (an accompanying corrections if needed) on a new or updated database to ensure that it meets documented specifications and quality criteria.
	GIS Data Integration	Includes horizontal and vertical integration operations that involve certain types of processing and packaging of data from multiple datasets. Horizontal integration involves collecting pieces of data from multiple stewards, merging them into a seamless dataset and providing easy access by users, usually through a Web-based service. The integrator may also carry out some value-added service, such as data format translation, data restructuring, and combining data sets to provide more effective offerings for the user community. Vertical integration assures topological integrity among thematic datasets. This requires familiarity with multiple data standards, thematic content, integrators and working groups. For example, vertical integration is necessary for roads, bridges and culverts with surface waters over orthoimagery.
	Providing GIS Data and Related Services	The process and service for providing GIS data, normally through a Web-based service. Services include metadata query and search, direct interactive viewing, on-line GIS applications, and data download.

2.2 MISSION AND GOALS FOR navigatOR

The mission of the navigatOR initiative is:

To build and maintain a comprehensive, detailed, and high-quality framework geographic database and to establish an environment for effective access to and sharing of geographic data and services to benefit all organizations and the citizens of Oregon.

This mission will be met by accomplishing the following major goals:

Goal 1: Accelerate development of and fully complete the Oregon Geographic Framework Data, providing a comprehensive, statewide, high-quality database to drive location-based applications.

Description: A foundation of navigatOR is a complete, high-quality geographic database. The focus is on full development, with statewide detailed coverage, of data elements of the 14 Framework data themes. The goal calls for acceleration of the current slow pace of database development to complete this work within six years. This will require the leveraging of all available resources and the involvement of many organizations that are in a position to gather and provide source materials and to participate in the database development work.

Goal 2: Encourage and support geographic data sharing and access for a broad community of users throughout Oregon, including all levels of government, the private sector, not-for-profit organizations, and the general public

Description: navigatOR will provide improved technical tools and an organizational environment for distribution and sharing of geographic data. Web-based services will make it easy for users to search and locate available data, access it on-line, or receive a copy of the data for use. The procedures and tools for data access and distribution will respect data ownership and address issues of confidentiality, privacy, and security.

Goal 3: Install an effective organizational structure, policies, and procedures that encourage and enable long-term collaboration and support for navigatOR

Description: Making navigatOR successful will require sound governance along with a well-defined organizational structure, formal policies and procedures. This structure encourages and enables formal participation from all elements of the user community in Oregon. A clear definition of leadership and authority roles supported by effective management and operations will be put in place.

Goal 4: Provide an efficient environment and tools to support ongoing update of geographic data and metadata

Description: Ongoing update of geographic data goes hand-in-hand with full development of Framework layers. This means establishing clear responsibilities, timing, quality criteria, and procedures for regular update of each data element. This ensures that high-quality data will continue to be provided for users and that navigatOR will build on and add value to the initial investments in geographic data development.

Goal 5: Provide effective Web-based services for easy access to geographic data and related services

Description: navigatOR will provide certain Web-based services accessible by users simply through Web browsers without the need for any additional software or data to be stored locally. These services will include searching and display of geographic data and certain other commonly needed services that support and drive common business processes of government at all levels, and enhance data access and analysis for all users.

2.3 STRATEGIC IMPORTANCE OF GOALS

Oregon's Governor has identified several principles that represent areas of need for Oregonians and which serve as a foundation for public policy and programs at the state, regional and local levels. These principles are:

1. The most vulnerable Oregonians have their basic health, food, and shelter needs met.
2. Oregon has a positive business climate and invests in economic development in order to create and retain sustainable businesses and family-wage jobs.
3. Oregon has a healthy balance between growth, infrastructure development and environmental protection.
4. Oregonians are safe in their homes, communities, and in state institutions.
5. State government is stable, responsive and accountable to Oregonians.

The GIS Utility addresses all of these principles by providing data and services that directly support the programs and operations of government offices and private businesses.

Principle	navigatOR Impact
1. Basic Needs	Provides data allowing effective statewide assessment of needs and planning and operational support for efficient provision of services for Oregonians.
2. Economic Development	Provides data and services for statewide and local-level economic development—identification of opportunities and development sites and interface with prospects. Also supports monitoring of economic and demographic conditions to support programs for employment and resources planning. The navigatOR initiative in itself directly promotes technology development projects throughout the state.
3. Growth Balance	Supports land use planning and project-specific decisions to support wise long-term decision-making and design and management of specific development projects.
4. Safety	Data and GIS services at the statewide and local level support emergency management initiatives, as well as local-level public safety tactical planning and response, particularly when integrated with other systems (e.g., public safety dispatch systems). GIS is primarily a tool to support law enforcement, fire services, and emergency medical services. The navigatOR initiative will provide the data content to be shared via the statewide wireless network currently under development.
5. Stable/Accountable Government	navigatOR promotes sharing of information resources and collaboration at all levels of government, thereby encouraging wise use of public funds. navigatOR geospatial data and services provide a better basis for evaluation of use and allocation of government resources and more efficient services.

2.4 ORGANIZATIONAL ENVIRONMENT FOR THE GIS UTILITY

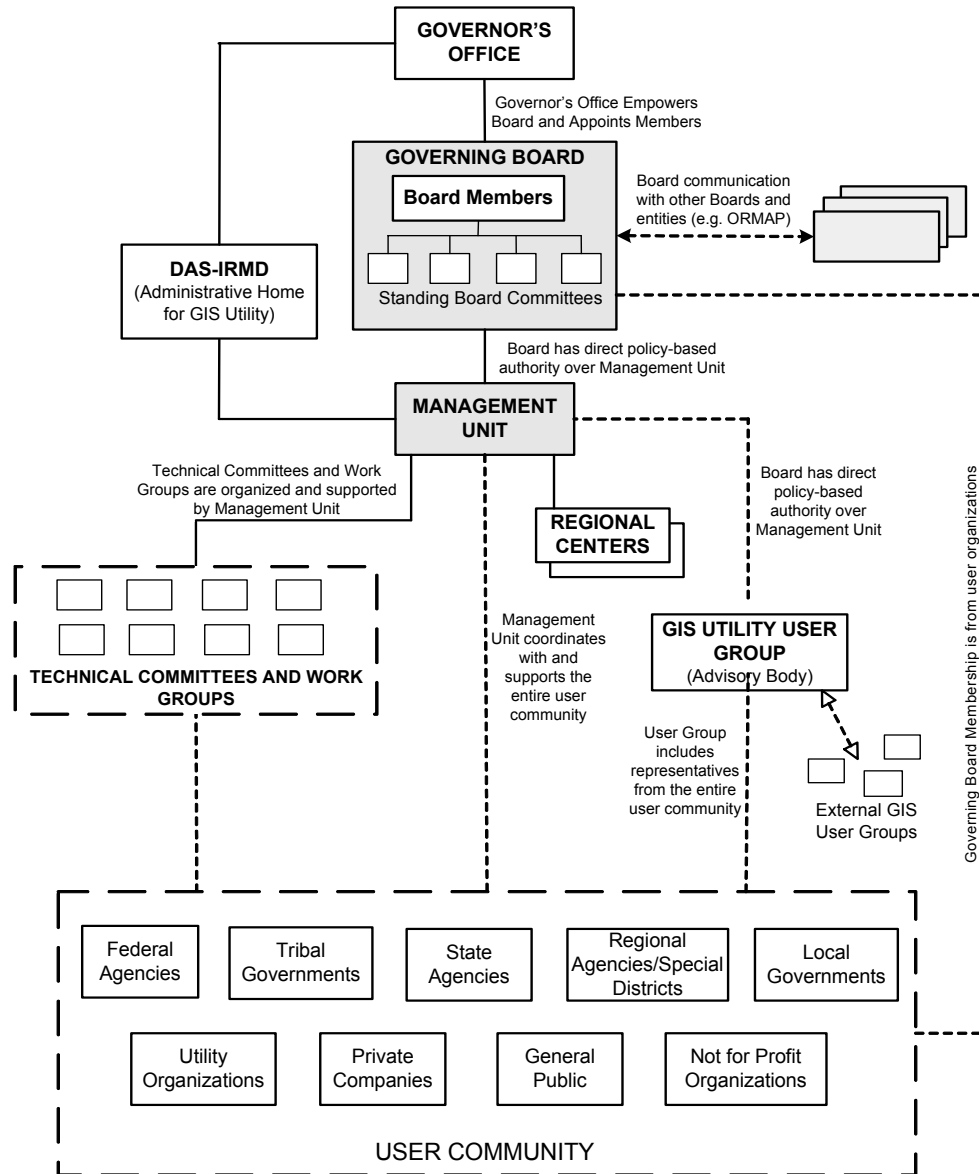
This *Implementation Plan* calls for establishing an organizational structure and assigning specific responsibilities for GIS Utility governance and administration. This structure builds on the existing GIS coordination and organizational hierarchy in place in Oregon to provide for improved GIS coordination and support. The Conceptual Design described the recommended organizational and governance structure in detail. The major entities in this organizational structure are identified in Table 2-2 and depicted in Figure 2-2.

Table 2-2: Proposed Organizational Components for Statewide GIS Coordination

Proposed Entity	Current Entity Playing Equivalent Roles	Explanation
GIS Utility Governing Board	OGIC	Composed of senior officials from organizations representing the statewide user community. The Board, empowered by an executive order issued by the Governor's Office, operates in a true governing capacity with explicit authority for directing and overseeing the GIS Utility Program and the GIS Management Unit. Note: OGIC now serves mainly as a high-level advisory body, not a true governing body, and carries out only limited oversight on operations.
Board Committees	None	Standing Committees composed of Board members that have clearly defined roles that support the Board's oversight and governing purpose. Note: There are currently no committees equivalent to Governing Board Committees as recommended in this Plan.
GIS Utility Management Unit	None	Includes a Manager and team that are responsible for meeting the objectives of the GIS Utility initiative (as clearly defined and approved by the Board) and handling all routine operations and administration of the program. Other organizational elements are defined which provide for effective long-term coordination and operation.
Regional Resource Centers	None	Semi-independent centers run by designated organizations (e.g., community colleges) with system resources that support users in specific areas of the state. Each Regional Center will have a manager and staff and will be subject to certain standards and practices defined by the Governing Board and the GIS Utility Management Unit.
Technical Committees and Work Groups	Current Work Groups	Include standing Committees or time-limited entities (Work Groups) with specific and usually narrowly defined objectives. They exist to support GIS Utility implementation and ongoing operation and are set up, monitored, and supported by the GIS Management Unit. Committees would draw on the entire user community for participation. Each would have a clear leader and written plan of action. NOTE: Several groups operating under the OGIC umbrella (e.g., Standards Committee, Framework Implement Team) address some of the technical areas that are recommended for the GIS Utility.
User Group	GPL, current user groups, OGISA	

Figure 2-2 is an organizational chart that gives a general picture of relationships among the entities described above.

Figure 2-2: Recommended Organizational Structure of the GIS Utility Program



SECTION 3

IMPLEMENTATION TASKS AND SCHEDULES

3.1 DEVELOPMENT PHASES

navigatOR will be developed according to a phased approach in which elements of the system will be completed and deployed in an incremental fashion. Currently, Phase 1 (Requirements Assessment and Business Case) is ongoing and includes the assessment of user needs, preparation of a business case and conceptual design, and this implementation plan. The goal for Phase 1 is to garner necessary support for the effort and to create a technical and organizational foundation for subsequent development in later phases. It is important to note that during and after Phase 1, the Geospatial Data Clearinghouse (OGDC), administered by the Geospatial Enterprise Office, will continue to operate and provide data and basic services, via the Web, to statewide GIS users. OGDC resources, enhanced over time, will be the core system on which navigatOR will be based.

The main development of navigatOR will occur in Phases 2, 3, and 4, with full deployment and operation occurring in Phase 5. The planned development/deployment period covers six years from July 2005 to early in Phase 5 (by the end of 2011). Table 3-1 summarizes key objectives of Phases 2 through 5. This phase structure gives a general schedule context for the navigatOR development. Section 3.3 defines specific tasks and timing in more detail.

Table 3-1: Summary of navigatOR Development Phases

Phase Number and Name	Planned Timing	Organizational Objectives	Data Objectives	System Configuration Objectives	Other Objectives/Activities
Phase 2: Very High-Priority Organizational and System Development	January 2006 to June 2007	- Establish a strong executive mandate and governing board with clear policies and procedures - Establish GEO as designated GIS Utility Management Unit and GEO roles and resources - Set up/oversee committees/work groups - Work with agencies for business process improvement and use of GIS - Pursue funding adjustments and joint project opportunities - Identify/register participants (all state agencies, selected regional and local government, selected non-public sectors) - Evaluate/identify sites for Regional Centers	- Confirm data standards - Complete very high-priority Framework data development - Set up data update/data replication, and QA procedures for very high-priority Framework data - Build and deploy metadata - Design and set up data maintenance tools and procedures (for data sets deployed in this phase)	- Upgrade HW and SW for GEO - Move Core Center to State Data Center facility and set up system admin and network links - Set up initial applications and services - Investigate/Design Regional Centers - Pursue agency GIS server consolidation - Support broadband network connections statewide - Plan implementation for Regional Centers	- Prepare detailed operation plan and policies - Plan initial pilot project (portal functionality) - Plan and conduct education and outreach activities - Ongoing monitoring and status reporting
Phase 3: Enhanced Organizational and System Development	July 2007 to June 2009	- Pursue and get statutory support - Ongoing oversight of Governing Board - Committees and work group operations - Continue work with agencies for business process improvement and use of GIS - Pursue additional funding adjustments and joint project opportunities - Identify additional participants (50 percent of counties and additional municipal, regional, and non-public sector participants)	- Complete all high-priority Framework data development - Set up data update/data replication procedures for high-priority Framework data - Build/deploy metadata for high-priority data - Design/set up data maintenance tools/procedures (for data sets deployed in this phase)	- Upgrade HW and SW - Build enhanced data management applications and services - Put at least one Regional Resource Center in operation	- Prepare detailed operational plan - Complete initial pilot project, and plan additional pilots for local/regional agencies - Continue education and outreach activities
Phase 4: High and Moderate Priority System Development	July 2009 to June 2011	- Ongoing oversight of Governing Board - Committees and work group operations - Continue work with agencies for Business Process Improvement and use of GIS - Pursue additional funding and joint project opportunities - Sign up additional participants (85% of counties and additional municipal, regional, and non-public sector participants)	- Complete most moderate-priority Framework data development - Set up data update/data replication/QA procedures for moderate-priority Framework data - Build/deploy metadata for high-priority data - Design/set up data maintenance tools/procedures (for data sets deployed in this phase)	- Upgrade HW and SW - Build enhanced data management applications and services - Put all Regional Resource Centers in operation	- Prepare detailed operational plan - Complete pilot project - Continue educational and outreach activities
Phase 5: Completion of Deployment and Ongoing Operations	July 2011 and future	Sign up additional participants and continue oversight of Governing Board and committees.	Complete/deploy all but low-priority Framework data; continue work in adding low-priority data themes. Deploy all data for access; set up data maintenance procedures.	Continue system upgrades and expansion and ongoing operations and system administration.	Continue monitoring and reporting, outreach, and educational activities.

3.2 RISKS

The *GIS Utility Risk Identification and Mitigation Plan* included an identification of risks impacting the design and implementation of the GIS Utility and strategies for avoiding or reducing the impact of those risks. This risk evaluation process has been one input in the implementation plan preparation, and the strategies described in the Risk Mitigation Plan are a guide for those involved in the implementation process. Two overall categories of risks are taken into account in the planning and business case preparation for the GIS Utility—1) the status quo, and 2) GIS Utility development. The first, “status quo risks,” addresses the negative consequences of continuing current approaches to mapping and geographic information management (i.e., not initiating significant efforts to build the statewide GIS Utility). The status quo is characterized by the current situation in which there is considerable use of GIS in a somewhat non-coordinated environment, inconsistently mature data sets for different areas of the state, and no statewide network and structure that supports effective sharing of geographic data and services. The second major category, “GIS Utility Program Risks,” relates specifically to the GIS Utility development effort and ongoing operation. These relate to conditions or events that have the potential for causing project delays, increase in costs, or other impacts on the scope and quality of the project results. Of these two types of risks, it is the GIS Utility Development risks which are of most significance to implementation planning.

Table 3-1 provides a summary of the GIS Utility Development risks. Table 3-2 lists each of the risks and identifies the type and general level of impact. Interested readers should consult the *GIS Utility Risk Identification and Mitigation Plan* for a more complete description of the risks and risk management strategies.

Table 3-2: GIS Utility Implementation Risk Impacts

Risk	Potential Impact Types*			
	Cost	Schedule	Scope	Quality
A. Funding/Resource Allocation				
A1. Insufficient funding allocation	P	S	S	S
A2. Dedicated staff resources not sufficient or available		P	P	S
A3. Resource support commitments from state agencies insufficient		P	P	S
A4. Cost projections do not meet actual costs	P	S	S	S
B. Organizational/Political				
B1. Insufficient support in state legislature	P	S		
B2. Lack of awareness/support at senior executive level	P	S		
B3. Insufficient support and participation among regional and local governments	S	S	P	
B4. Insufficient participation and support by non-public sector organizations	S	S	P	
B5. Ineffective coordination with federal agencies		S	P	P
B6. Legal/Policy restrictions on data distribution		S	P	P
B7. Public-Private partnership obstacles	P		P	S
C. Technical and Procedural				
C1: Database development delays		P	S	
C2: Wide area network limitations		S		S
C3: Lack of maturity or consensus on technical standards		S	S	S
C4: Poor contractor performance	P	P	P	P
C5: Network and data administration and security problems			S	P
C6: User adoption and support problems		S	P	S

***Impact Type** refers to the nature of risk and its effect on GIS Utility development or operation. The impact is subjectively assigned a "P" for primary impact, an "S" for secondary impact, or a blank indicating no significant impact. Impact types include:

- **Cost** = Funding levels (from multiple sources) that are insufficient to support development and sustain operations
- **Schedule** = Implies significant delays in the planned timing of tasks and milestones that have a negative impact on deployment and use of the GIS Utility
- **Scope** = Risk impacts that can result in failure to meet all project objectives and to produce planned deliverables in the manner defined in the project plan
- **Quality** = Effects on the project that could result in failure to meet specifications for deliverables or reduced service levels.

3.3 IMPLEMENTATION TASKS AND TIMING

GIS Utility implementation activities will require work in detailed planning and design, allocation of resources, upgrading and acquisition of systems, a host of technical development activities, and related training and user support. As a starting point toward a more detailed operational plan to be prepared in Phase 1, this section summarizes key activities by phase. Table 3-3 lists these major activities by phase and organizes them into the following categories or “tracks”:

- **Track 1: Establishing Organizational, Governance, Financial Structure:** Establishing the GIS Utility through an Executive Order, creating the organizational and governance structure, and preparing policies and documents for GIS Utility initiation.
- **Track 2: Ongoing Administration and Operation Management:** All activities for ongoing governance, management, and operations of the GIS Utility. Addresses all key areas including Governing Board actions, status monitoring and reporting, financial and contract management, personnel assignment and management, and coordination of the work of different groups.
- **Track 3: Hardware/Software/Network Development and Set-Up:** Development of specifications, acquisition, installation, system upgrades, and ongoing administration of GIS Utility hardware, software, and network components.
- **Track 4: Database Design, Development, and Ongoing Maintenance:** Long-term planning and all activities for Framework database development, including database design, development of specifications, setting up and managing projects, procuring database development services, ongoing database update and quality assurance, and all processes for posting data for access through the navigatOR portal.
- **Track 5: Portal and Application Design, Development, Deployment:** All work in the design and development of Web-based portal access to data and services and the design and development of all applications supporting user requirements, as well as database maintenance and administration.
- **Track 6: Education, Outreach, and User Support:** Planning and ongoing management and execution of all types of educational and outreach programs and activities, including general education and promotion, senior management briefings, user training and support, professional development, etc., for the GIS Utility team and for the user community as a whole.

Table 3-3: Summary of GIS Utility Implementation Activities by Track

Project Task	Start Date	End Date	Phases
TRACK 1: ESTABLISHING ORGANIZATIONAL, GOVERNANCE, FINANCIAL STRUCTURE	11/21/05	4/18/14	
1.1. Executive Order for GIS Utility Initiative	1/2/06	4/21/06	2
Includes securing the support of the Governor's Office and all steps in the preparation and issuance of the Executive Order (EO) for creation of the GIS Utility program. The EO should concisely state the purpose and overall structure of the GIS Utility. It should specially reference and call for the formation of the Governing Board and Management Unit for the GIS Utility. The EO should make general statements about organizational responsibility and set up an interim group to establish the Board and recommend specific individuals. The EO will be distributed and communicated widely among management and staff in user organizations. Subtasks include:			
1.1.1. Prepare Executive Order for Governor	1/2/06	1/27/06	2
1.1.2. Sign Executive Order	1/2/06	2/10/06	2
1.1.3. Communicate Executive Order	1/2/06	4/21/06	2
1.1.4. Set Up Interim Oversight Body	1/30/06	2/24/06	2
1.2. Charter Preparation and Board Formation	1/2/06	4/19/06	2
With the mandate provided by the Executive Order, the interim governance group and other GIS professionals will create a Charter that acknowledges wide support for the GIS Utility and the overall goals and approach for meeting those goals. While this is in progress, the interim group will recruit and identify members for the Governing Board and recommend these to the Governor's Office, which is responsible for formal board appointments. The Board is activated and takes action on ratification of the Charter. Subtasks include:			
1.2.1. Reach Consensus on Governance Structure	1/2/06	1/27/06	2
1.2.2. Prepare Charter	1/30/06	3/10/06	2
1.2.3. Ratify Charter	2/27/06	3/24/06	2
1.2.4. Prepare and Ratify Agency Support Agreements	1/16/06	3/24/06	2
1.2.5. Define Board Role and Structure	1/16/06	2/24/06	2
1.2.6. Recruit and Assign Board Membership	2/2/06	3/15/06	2
1.2.7. Activate Board	3/9/06	4/19/06	2
1.3 Governing Board Start-up and Policy Development	4/13/06	4/4/14	2
Includes education and orientation to Board members about the GIS Utility and their role. Board members select a Board Chair and other officers and the Board starts initial work in the development of bylaws and governance policies. The Board works in a true policy-based governing capacity in which formal policies lay out goals (ends) and the means (for the Board itself and executive management) to reach these goals. The Board sets up its own internal structure, including the formation of standing committees. Subtasks include:			
1.3.1. Assign Board Chairs and Other Leaders	4/13/06	5/24/06	2
1.3.2. Orient Board Members	4/20/06	5/24/06	2
1.3.3. Define Board By-Laws	5/25/06	7/12/06	2
1.3.4. Define Initial GIS Utility Governance Policies	5/25/06	1/31/07	2

Table 3-3: Summary of GIS Utility Implementation Activities by Track (continued)

Project Task	Start Date	End Date	Phases
TRACK 1: ESTABLISHING ORGANIZATIONAL, GOVERNANCE, FINANCIAL STRUCTURE (continued)	11/21/05	4/18/14	
1.3 Governing Board Start-up and Policy Development (continued)	4/13/06	4/4/14	2
1.3.5. Establish Board Committees	5/25/06	9/27/06	2
1.3.6. Revise and Adjust Board Structure and Policies	12/20/07	4/4/14	2
1.4. Assign and Set-up Management Unit	2/13/06	4/18/14	
The Board, working with the Governor's Office and DAS to formally create the GIS Utility Management Unit (GEO). A Manager and staff are assigned. The Manager, with help from staff and in coordination with the Board and DAS management, defines operating policies and practices and submits these to the Board for review and approval. Subtasks include:			
1.4.1. Define Positions for GIS Management Unit	2/13/06	3/10/06	2
1.4.2. Orient Board Members	2/13/06	3/10/06	2
1.4.3. Define Board Bylaws	2/13/16	3/10/06	2
1.4.4. Define Initial GIS Utility Governance Policies	2/13/06	9/8/06	2
1.4.5. Establish Board Committees	7/2/07	4/18/14	3, 4, 5
1.5. Set-up Overall Organizational Structure, Establish Initial Technical Committees and Work	2/13/06	6/28/13	
Includes the definition and set-up of the organizational elements external to the Board. The Management Unit is responsible for the initial formation of Technical Committees, time-limited Work Groups, the User Group, and any other organizational elements. Accompanying this should be clear documentation about the role and purpose of these groups and protocols for communications and workflow between them. Subtasks include:			
1.5.1. Groups	2/13/06	8/25/06	2
1.5.2. Establish User Group	2/13/06	8/25/06	2
1.5.3. Define Protocol and Procedures for Communications	2/13/06	11/17/06	2
1.5.4. Groups and Technical Committees	7/2/07	6/28/13	2
1.6. Establish Funding Mechanisms and Financial Controls	11/21/06	6/28/13	
This ongoing task includes all work identifying and securing funding sources, including sources inside and outside of state government. Work includes all searching for sources, exploring partnerships and joint funding opportunities, grants, and collaborative projects. Administrative procedures are put in place to track status and disposition of funding, preparing and putting in place administrative procedures for tracking costs and expenditures. Subtasks include:			
1.6.1. Identify Initial Funding Sources	1/2/06	10/6/06	2
1.6.2. Prepare Long-term Budget	11/21/06	1/13/07	2
1.6.3. Prepare and Ratify Funding Agreements	7/31/06	6/28/07	2
1.6.4. Explore and Identify Additional Funding	8/10/07	6/28/13	2
1.6.5. Secure New Funding	11/2/07	6/28/13	2

Table 3-3: Summary of GIS Utility Implementation Activities by Track (continued)

Project Task	Start Date	End Date	Phases
TRACK 1: ESTABLISHING ORGANIZATIONAL, GOVERNANCE, FINANCIAL STRUCTURE (continued)	11/21/05	4/18/14	
1.7 Legislative Support	3/1/06	6/28/13	
In the future, it will be beneficial to get formal acknowledgment, in the form of a resolution or actual legislation, from the State Legislature. The Board, working with the Governor's office and the GIS Utility Manager, will explore opportunities for legislative support and pursue such opportunities with legislators and their staff. This support may begin with acknowledgment by one or more legislative committees. This work will lead to formal action by the Legislature. Subtasks include:			
1.7.1. Evaluate Legislative Support Opportunities	3/1/06	12/19/06	2
1.7.2. Get Initial Legislative Recognition	10/25/06	3/13/07	2
1.7.3. Prepare and Generate Support for Legislation	10/25/06	3/13/07	2
1.7.4. Ratify Legislation	3/14/07	5/22/07	2
1.7.5. Ongoing Reporting to Legislative Body	10/10/07	6/28/13	2
1.8. Identify and Set-up Regional Center Sites	1/2/06	6/28/13	
Includes all the logistical, legal, and administrative work in identifying and officially designating sites and organizations for the Regional Resource Centers. Regional Centers (perhaps up to 4 or even more) will be identified through the GIS Utility development (not all at once). In each case, work will be done to identify and qualify potential sites, confirm available resources, prepare and ratify agreements, and set up administrative tools and procedures for proper coordination with the GIS Utility Management Unit. Each Regional Center will need to assign management and staff and create its own operating procedures. Subtasks include:			
1.8.1. Define Overall Intent and Qualifications for Regional Centers	1/2/06	6/16/06	2
1.8.2. Research and Identify Potential Sites	1/2/06	11/30/07	2, 3
1.8.3. Select Initial Site or Sites	2/13/06	3/21/08	2
1.8.4. Prepare/Ratify Terms for Regional Center Operation	4/10/06	5/1/09	2
1.8.5. Regional Centers	6/19/06	12/12/08	2
1.8.6. Assign Regional Center Management and Staff	7/17/06	1/9/09	2
1.8.7. Set Up Initial Regional Center(s)	4/10/06	5/1/09	2
1.8.8. Select and Set Up Additional Regional Centers	6/15/09	6/28/13	3, 4, 5
TRACK 2: ONGOING ADMINISTRATION AND OPERATIONAL MANAGEMENT	11/21/05	4/18/14	
2.1. Governing Board Operations and Administrative Support	3/25/06	7/12/13	2,3,4,5
After formation of the Board in 1.3, the Board begins its operations under the bylaws and policies defined. This should begin with some strategic visioning to confirm goals of the GIS Utility. The Board and its committees continue to operate and meet (according to an approved schedule), oversee progress, make decisions (on high-level issues defined through policy). Committee work is particularly important; committee research and recommendations will often result in formal actions by the Executive Committee or full Board. When appropriate, the Board will provide support to the Management Unit--particularly in such areas as securing funding, budgeting, and external communications. Subtasks include:			

Table 3-3: Summary of GIS Utility Implementation Activities by Track (continued)

Project Task	Start Date	End Date	Phases
TRACK 2: ONGOING ADMINISTRATION AND OPERATIONAL MANAGEMENT (continued)	11/21/05	4/18/14	
2.1. Governing Board Operations and Administrative Support (cont.)	3/25/06	7/12/13	2,3,4,5
2.1.1. Create Strategic Vision	3/16/06	4/26/06	2
2.1.2. Board Policy Revision	8/2/07	7/12/13	2
2.1.3. Board Decision-making and Approval of Actions	3/9/06	6/28/13	2,3,4,5
2.1.4. Provide Status Reports and Recommendations to Board	3/9/06	6/28/13	2,3,4,5
2.1.5. Respond to Board Information Requests	3/9/06	6/28/13	2,3,4,5
2.1.6. Provide Administrative Support to Board	3/9/06	6/28/13	2,3,4,5
2.2 User Participation and Registration	1/2/06	6/28/13	
There will be a process for users to "register" for GIS Utility participation. This includes users from all public and non-public sector agencies and organizations. A simple process will be designed. Subtasks include:			
2.2.1. Prepare Instruments and Process for User Participation	1/30/06	2/10/06	2
2.2.2. Actively Promote Statewide Participation	1/2/06	2/23/07	2
2.2.3. Register Participants	3/27/06	6/28/13	2,3,4,5
2.2.4. Monitor User Satisfaction	5/8/06	6/28/13	2,3,4,5
2.3. Personnel Assignment and Management	2/13/06	6/28/13	
Includes all work in defining management and staff positions for the GIS Utility Management Unit, personnel recruitment and hiring, and assignment of roles. It also includes monitoring and evaluation of management and staff performance. The Board is responsible for review of the Manager and the Manager reviews and documents performance of the staff. Any ongoing personnel actions (hirings, promotions, job class changes, disciplinary actions, etc.) are carried out here. Subtasks include:			
2.3.1. Recruit and Assign Initial Staff	2/13/06	12/29/06	2
2.3.2. Governing Board Monitor Performance of Management	4/20/06	6/28/13	2,3,4,5
2.3.3. Evaluate Staff Performance (Manager)	3/27/06	6/28/13	2,3,4,5
2.3.4. Monitor User Satisfaction	5/8/06	6/28/13	3,4,5
2.3.5. Take Necessary Personnel Action	3/27/06	6/28/13	2,3,4,5

Table 3-3: Summary of GIS Utility Implementation Activities by Track (continued)

Project Task	Start	End Date	Phases
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	Date		
TRACK 2: ONGOING ADMINISTRATION AND OPERATIONAL MANAGEMENT (continued)	11/21/05	4/18/14	
2.4. Securing Funding, Budgeting, and Budget Management	11/21/05	6/28/13	
This task follows work in 1.6 in which funding sources are explored and identified. Those funds are secured through agreements prepared here. In coordination with the Board and with its approval, multi-year budget projections are made and annual budgets are prepared and submitted for review according to procedures established by the Board. Ongoing tracking of budget status and expenditures is carried out and reports are prepared on a regular basis. Subtasks include:			
2.4.1. Identify and Allocate Initial State Government Funding	11/21/05	2/10/06	2,3,4,5
2.4.2. Explore and Secure Federal Funding Sources	1/2/06	6/28/13	2,3,4,5
2.4.3. Explore and Secure Other Funding Sources	1/2/06	6/28/13	2,3,4,5
2.4.4. Prepare/Approve Phase 2 Budget	11/21/05	2/10/06	2
2.4.5. Prepare/Approve Phase 3 Budget	10/2/06	4/13/07	2
2.4.6. Prepare/Approve Phase 4 Budget	10/1/08	4/14/09	3
2.4.7. Prepare/Approve Future Budgets	10/4/10	6/7/13	4,5
2.4.8. Monitor Budget and Expenditures	1/2/06	6/28/13	2,3,4,5
2.4.9. Track and Report on Financial Status	2/13/06	6/28/13	2,3,4,5
2.5. Technical Committee and Work Group Activities/Coordination	3/6/06	6/28/13	
The Management Unit works with the user community and GIS professionals to form Technical Committees and Work Groups. The Technical Committees, which are standing or long-term, address key areas that support system design and development--some of which already operate under OGIC (Standards) and can be re-established under the GIS Utility. Work Groups have a more focused mission and time-limited nature. They research and provide recommendations on specific issues or provide project support and are disbanded when that work is complete. In each case members and leaders are assigned and action plans are prepared. Committees and Work Groups should be approved by the Board. Work is carried out, monitored, and reported on. Staff of the GIS Management Unit provides administrative support to these groups and in many cases participates actively as members. Subtasks include:			
2.5.1. Prepare Initial Technical Committee Action Plans	3/6/06	2/16/07	2
2.5.2. Prepare Initial Work Group Action Plans	3/6/06	2/16/07	2
2.5.3. Work Groups and Committees Carry Out Work	4/17/06	6/28/13	2,3,4,5
2.5.4. Revise and Develop New Action Plans	7/9/07	6/28/13	2,3,4,5
2.5.5. Track and Report Progress	4/2/07	6/28/13	2,3,4,5

Table 3-3: Summary of GIS Utility Implementation Activities by Track (continued)

Project Task	Start Date	End Date	Phases
TRACK 2: ONGOING ADMINISTRATION AND OPERATIONAL MANAGEMENT (continued)	11/21/05	4/18/14	
2.6. Inter-Organizational Partnerships and Relationships	11/21/05	6/28/13	
There is an ongoing process through the development period and into operation to identify strategic partners for joint projects, data sharing, and other collaboration. This includes identifying these groups (public, not-for-profit, private), building organizational links, forging agreements where appropriate, and maintaining communication. Subtasks include:			
2.6.1 Identify Initial Partners and Roles	11/21/05	12/15/06	2
2.6.3 Monitor External Relationships	1/2/06	6/28/13	2,3,4,5
2.6.4 Communicate on Regular Basis	1/2/06	6/28/13	2,3,4,5
2.6.5 Revise Agreements and Forge New Agreements	7/4/07	6/28/13	3,4,5
2.7 Contractor and Vendor Management	3/25/05	6/30/09	
Includes all legal, contractual, and administrative aspects of contractor and vendor management. Early in development, roles for vendors and contractors are identified and standard contract terms for products or professional services contracts are prepared (in accordance with existing rules and language). This includes contracts (mostly managed by the Management Unit) prepared in support of specific aspects of GIS Utility development (database conversion, HW/SW acquisition, etc.). Contracts are prepared and ratified, and contracts are monitored and managed. Subtasks include:			
2.7.1 Identify Roles for Private Contractors	3/25/05	7/14/05	2
2.7.2 Prepare Standard Terms for Product/Service Contracts	5/20/05	9/15/05	2
2.7.3 Approve Selection and Ratify Contracts	7/29/05	12/15/05	2
2.7.4 Oversee and Manage Contracts	9/9/05	6/30/09	2,3
2.7.5 Review/Revise Contract Terms	1/2/06	1/2/06	2
2.8 Status Tracking and Reporting	2/13/06	6/28/13	
Includes all tracking of status by the Management Unit and reporting that follows that tracking. The Management Unit gets information from Technical Committees, Work Groups, and project teams and prepares summary reports on status and provides these reports to designated parties and makes them available to all participants. Subtasks include:			
2.8.1. Set Up Procedures and Tools for Project Management	2/27/06	9/22/06	2
2.8.2. Organize Status Tracking and Reporting Structure	2/13/06	4/21/06	2
2.8.3. Ongoing Tracking of Progress	2/27/06	6/28/13	2,3,4,5
2.8.4. Prepare Board Quarterly Reports	2/27/06	6/28/13	2,3,4,5
2.8.5. Prepare Detailed Project Status Reports	2/27/06	6/28/13	2,3,4,5
2.8.6. Project Team Meetings and Communications	2/27/06	6/28/13	2,3,4,5
2.8.7. Revise GIS Utility Implementation Plan as Necessary	2/27/06	6/28/13	2,3,4,5

Table 3-3: Summary of GIS Utility Implementation Activities by Track (continued)

Project Task	Start	End Date	Phases
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	Date		
TRACK 3: HW/SW/NETWORK DEVELOPMENT, SET-UP, AND ADMINISTRATION	10/10/05	7/26/13	
3.1 Reach Consensus on HW, SW, and Network Standards	11/21/05	2/10/06	
Taking into account the current standards and the GIS configuration supported by GEO for the OGDC, a consensus will be reached on standards and HW/SW products on which the GIS Utility will initially be built. It is likely that such consensus will be the work of a Technical Committee. These standards will be the basis for technical specifications and development. Subtasks include:			
3.1.1. Identify Standard Core GIS Software	11/21/05	1/27/06	1,2
3.1.2. Decide on Standard Core RDBMS Software	11/21/05	1/27/06	1,2
3.1.3. Confirm Hardware and Network Standards	11/21/05	2/24/06	1,2
3.1.4. Revise Standards and Practices as Necessary	7/17/06	7/17/06	3
3.2 Initial Upgrades at GGDC	10/10/05	7/28/06	
Initial GIS Utility operations will use current HW and SW managed by GEO to support GIS applications and the OGDC now at the General Government Data Center. The current configuration and upgrades in progress as of the end of 2005 will be sufficient to support GIS utility operations through 2006. Subtasks include:			
3.2.1 Acquire Upgrades	10/10/05	2/10/06	1,2
3.2.2 Install and Configure Upgraded HW/SW	2/27/06	7/28/06	2,3
3.3 SDC Move and Set-up	1/30/06	12/15/06	
GIS Utility HW/SW will move to the state's new consolidated data center, and systems will be configured to work with consolidated systems for mass storage, security, data back-up and network links. Subtasks include:			
3.3.1 Plan and Organize Move	1/30/06	5/19/06	2
3.3.2 Move or Retire Systems and Set Up New Facilities	7/31/06	10/20/06	3
3.3.3 Configure and Test All Systems	8/28/06	11/17/06	3
3.3.4 Bring Systems Online	9/11/06	12/15/06	3
3.4 Phase 3 Core HW/SW Acquisitions and Upgrades	1/2/07	2/2/09	
HW/SW upgrade needs, as cited in the Conceptual Design for Phase 3, are finalized and specifications are prepared. Following procurement rules defined by the Board, procurement materials are prepared, suppliers evaluated, and purchases are made (or leases negotiated). HW and SW is delivered, installed, tested and brought online. Subtasks include:			
3.4.1. Identify Upgrade Requirements and Specifications	1/2/07	4/23/07	2
3.4.2. Prepare Acquisition Materials	4/10/07	12/17/07	2
3.4.3. Procure HW/SW Upgrades	11/6/07	10/6/08	2,3
3.4.4. Install and Configure Upgrades	12/11/07	2/2/09	2,3

Table 3-3: Summary of GIS Utility Implementation Activities by Track (continued)

Project Task	Start Date	End Date	Phases
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TRACK 3: HW/SW/NETWORK DEVELOPMENT, SET-UP, AND ADMINISTRATION	10/10/05	7/26/13	
3.5 Phase 4 Core HW/SW Acquisitions and Upgrades	1/2/09	2/3/11	
HW/SW upgrade needs, as cited in the Conceptual Design for Phase 3, are finalized and specifications are prepared. Following procurement rules defined by the Board, procurement materials are prepared, suppliers evaluated, and purchases are made (or leases negotiated). HW and SW is delivered, installed, tested and brought online. Subtasks include:			
3.5.1. Identify Upgrade Requirements and Specifications	1/2/09	4/23/09	3
3.5.2. Prepare Acquisition Materials	4/10/09	12/17/09	3
3.5.3. Procure HW/SW Upgrades	11/6/09	10/7/10	3,4
3.5.4. Install and Configure Upgrades	12/11/09	2/3/11	3,4
3.6. Phase 5 Core HW/SW Acquisitions and Upgrades	1/3/11	2/1/13	
HW/SW upgrade needs, as cited in the Conceptual Design for Phase 5, are finalized and specifications are prepared. Following procurement rules defined by the Board, procurement materials are prepared, suppliers evaluated, and purchases are made (or leases negotiated). HW and SW is delivered, installed, tested and brought on-line. Subtasks include:			
3.6.1. Identify Upgrade Requirements and Specifications	1/3/11	4/22/11	4
3.6.2. Prepare Acquisition Materials	4/11/11	12/16/11	4
3.6.3. Procure HW/SW Upgrades	11/7/11	10/5/12	4,5
3.6.4. Install and Configure Upgrades	12/12/11	2/1/13	4,5
3.7 Initial Regional Center Design and Set-up	1/30/06	4/24/09	
System configurations at each Regional Center will be somewhat different depending on available resources and requirements, but there must be minimum standards for the HW and SW configuration ensuring interoperability and smooth exchange of data and sharing of applications between the Regional Centers and the Core Data Center. This task includes preparation of configuration standards for each Regional Center and the specific steps involved in procuring hardware, software, and equipment and setting up facilities during Phase 2 and Phase 3. Subtasks include:			
3.7.1. Design Standard HW/SW Configuration	1/30/06	5/5/06	2
3.7.2. Identify Location and Facilities for Initial Regional Center(s)	2/13/06	3/21/08	2
3.7.3. Prepare Specifications/Plan for Initial Regional Center Implementation	4/24/06	8/8/08	2,3
3.7.4. Procure HW, SW, and Equipment for Regional Center	6/5/06	2/6/09	2,3
3.7.5. Install, Configure, and Test Systems at Regional Center(s)	6/26/06	4/24/09	2,3

Table 3-3: Summary of GIS Utility Implementation Activities by Track (continued)

Project Task	Start Date	End Date	Phases
TRACK 3: HW/SW/NETWORK DEVELOPMENT, SET-UP, AND ADMINISTRATION	10/10/05	7/26/13	
3.8 Additional Regional Center Design and Set-up	7/6/09	6/28/13	
Includes preparation of detailed specifications and plans, procurement of hardware, software, and equipment, and setting up of Regional Centers during Phase 4 and Phase 5. Subtasks include:			
3.8.1 Identify Location and Facilities for Additional Regional Center(s)	7/6/09	8/27/10	3,4
3.8.2 Prepare Specifications/Plan for Regional Center Implementation	8/3/09	4/6/12	4,5
3.8.3 Procure HW, SW, and Equipment for Regional Center	9/14/09	2/22/13	4,5
3.8.4. Install, Configure, and Test Systems at Regional Center	10/26/09	6/28/13	4,5
3.9 Research and Evaluate Industry Trends and Products	1/2/06	6/28/13	
While technical standards and products are identified early in development, there will be a continual monitoring of industry trends and products for changes, new offerings, and new practices that might improve the GIS Utility. This task includes keeping abreast of the trends and identification of new standards or products that should be incorporated into the GIS Utility configuration. Subtasks include:			
3.9.1. Gather Information from Sources	1/2/06	6/28/13	2,3,4,5
3.9.2. Review Trends and Make Recommendations for GIS Utility	5/22/06	6/28/13	2,3,4,5
3.10 Ongoing System Administration and Monitoring	6/19/06	7/26/13	
Includes ongoing system monitoring and administration work at the Core Center and the Regional Centers. This includes acquiring and configuring system administration software; configuring networks, directory structures, and user accounts; monitoring system and network performance; fixing problems as they occur; performing backups, etc. For the Core Center, much of this work is carried out by designated SDC personnel. Subtasks include:			
3.10.1. Acquire Additional Software for System Administration	7/31/06	12/15/06	2
3.10.2. Define/Document System Administration Practices and Procedures	7/31/06	2/23/07	2
3.10.3. Configure Directories, Networks, User Accounts	8/28/06	3/23/07	2
3.10.4. Ongoing Monitoring of System Performance	10/9/06	6/28/13	2,3,4,5
3.10.5. Perform Regular System Backup	10/9/06	6/28/13	2,3,4,5
3.10.6. Monitor Portal and Application Use	6/19/06	7/26/13	2,3,4,5
3.10.7. Prepare Regular System Administration Reports	10/9/06	6/28/13	2,3,4,5
3.10.8. Regional Center System Administration	3/30/09	6/28/13	2,3,4,5
3.10.9. Diagnose and Fix System Problems	11/6/06	6/28/13	2,3,4,5

Table 3-3: Summary of GIS Utility Implementation Activities by Track (continued)

Project Task	Start Date	End Date	Phases
TRACK 4: DB PLANNING/DESIGN/DEVELOPMENT, ONGOING MAINTENANCE	1/2/06	6/28/13	
4.1 Database Development Operational Planning	1/2/06	6/16/06	
Framework database development is the single most important goal for the GIS Utility development process. The scope of this goal necessitates an initial effort for overall prioritization and planning, following work already done in Phase 1. After confirming priorities with appropriate parties (e.g., Technical Committee created from existing Framework Implementation Team), an overall strategy is prepared that provides a high-level, long-term picture for database development. Subtasks include:			
4.1.1. Confirm Framework Implementation Team Leaders and Members	1/2/06	2/10/06	2
4.1.2. Confirm Framework Data Priorities	1/2/06	3/24/06	2
4.1.3. Gather Detailed Information on Status and Sources	1/30/06	6/16/06	2
4.1.4. Prepare Strategy for Framework Database Development	2/27/06	5/26/06	2
4.2 Logical Database Modeling and Standards	1/16/06	8/25/06	
The logical model is an identification of major data entities (with clear name and description), key attributes, and relationship between them. The model entities would reflect the agreed breakdown of Framework themes and elements within those themes. This model is an overall blueprint to guide long-term development and a step toward physical database designs to be prepared in 4.4. This model should include entities that reference data already in existence or in development, as well as data elements yet to be developed. Subtasks include:			
4.2.1. Assemble Team for Modeling and Standards Definition	1/16/06	2/24/06	2
4.2.2. Prepare Draft High-Level Logical Database Model	1/30/06	4/7/06	2
4.2.3. Review and Revise Logical Design	4/10/06	4/28/06	2
4.2.4. Confirm/Revise Existing Standards for Framework Data Themes	1/30/06	4/7/06	2
4.2.5. Identify/Develop Additional Standards	1/30/06	6/16/06	2
4.2.6. Identify Standards for non-Framework Data	4/10/06	8/25/06	2
4.3 Augment Data on Current OGDC	1/2/06	9/22/06	
Phase 2 GIS Utility operations will rely on the existing facilities and data access functions available through the Oregon Geospatial Data Clearinghouse (OGDC). During Phase 2, OGDC will be enhanced with additional functionality and data as it becomes available. Subtasks include:			
4.3.1. Identify Data for Addition to OGDC	1/2/06	3/10/06	2
4.3.2. Configure OGDC and Load Additional Data	2/27/06	9/22/06	2

Table 3-3: Summary of GIS Utility Implementation Activities by Track (continued)

Project Task	Start Date	End Date	Phases
TRACK 4: DB PLANNING/DESIGN/DEVELOPMENT, ONGOING MAINTENANCE (continued)	1/2/06	6/28/13	
4.4. Physical Database Design and Specifications	3/27/06	6/28/13	
This design work and technical specifications (see 4.7, 4.8) are prepared for each data element. The physical design is a detailed definition of map feature structure and attribute data schemas in a format suitable for data population and loading (into the ArcSDE Geodatabase). This design work occurs continually throughout the development process following the general prioritization defined in the Conceptual Design and confirmed in 4.1. This design work pertains not only to the Framework Data Themes but also to the associated metadata. In the case of data themes that already exist, it may or may not be necessary to examine and revise the design. Subtasks include:			
4.4.1. Design GIS Database for Very High and High Priority Themes	3/27/06	8/22/08	2,3
4.4.2. Design Metadatabase for Very High and High Priority Themes	5/22/06	10/17/08	2,3
4.4.3. Design GIS Database for Medium Priority Themes	8/25/08	1/21/11	3,4
4.4.4. Design Metadatabase for Medium Priority Themes	10/6/08	3/4/11	3,4
4.4.5. Design GIS Database for Other Themes	1/24/11	6/28/13	4,5
4.4.6. Design Metadatabase for Other Themes	3/7/11	6/28/13	4,5
4.5 Initial DB Development Project Organization/Set-up (Phase 2, 3)	1/30/06	2/22/08	
Database development efforts will occur individually for single Framework elements or groups of elements, and each of the efforts must be run as a separate, well-managed project. This task includes all work in setting up project structure, management, and teams for database development work initiated in Phases 2 and 3. Each project will need a manager, team, schedule, and budget along with clear management procedures. Subtasks include:			
4.5.1. Identify/Assign Project Manager	1/30/06	6/1/07	2,3
4.5.2. Assemble Team	2/27/06	6/29/07	2,3
4.5.3. Decide on Services Needed	2/27/06	9/7/07	2,3
4.5.4. Prepare Project Plans	3/13/06	9/21/07	2,3
4.5.5. Prepare Budget and Secure Funding	3/27/06	2/22/08	2,3
4.6 Additional DB Development Project Org./Set-up (Phase 3, 4, 5)	6/4/07	9/4/09	
Database development efforts will occur individually for single Framework elements or groups of elements, and each of the efforts must be run as a separate, well-managed project. This task includes all work in setting up project structure, management, and teams for database development work to be conducted primarily in Phases 4 and 5. Each project will need a manager, team, schedule, and budget along with clear management procedures. Subtasks include:			
4.6.1. Assign Project Manager	6/4/07	12/12/08	3,4
4.6.2. Assemble Team	7/2/07	3/20/09	3,4
4.6.3. Decide on Services Needed	7/2/07	5/29/09	3,4
4.6.4. Prepare Project Plans	7/16/07	6/12/09	3,4
4.6.5. Prepare Budget and Secure Funding	7/30/07	9/4/09	3,4

Table 3-3: Summary of GIS Utility Implementation Activities by Track (continued)

Project Task	Start Date	End Date	Phases
TRACK 4: DB PLANNING/DESIGN/DEVELOPMENT, ONGOING MAINTENANCE (continued)	1/2/06	6/28/13	
4.7 Prepare Initial Technical Specs for DB Development (Phase 2, 3)	3/27/06	6/13/08	
Technical specifications for database development are prepared for each specific project defined in 4.5 for Phase 2 and 3 efforts. While the format and content of specifications will vary depending on the specific data element, all specifications should be directed at the group that will be performing the development work (in-house or contracted services). All database development specifications share several common parts, including: project background and objectives, description of the data deliverables, sources to use, clear description of data content and format of the deliverables, database quality requirements, expected workflow and schedule, definition of roles, and project management process. When these specifications will be used for procurement of contracted services (e.g., included as part of an RFP), there may be specific requirements based on procurement rules. Subtasks include:			
4.7.1. Prepare Outline and Standard Language	4/10/06	6/16/06	2,3
4.7.2. Prepare Draft Specs for Internal Review (for each data element)	3/27/06	2/22/08	2,3
4.7.3. Prepare Final Specifications	5/8/06	6/13/08	2,3
4.8 Prepare Additional Technical Specs for DB Dev. (Phase 4, 5)	7/30/07	4/16/10	
Technical specifications for database development are prepared for each specific project defined in 4.5 for Phase 2 and 3 efforts. While the format and content of specifications will vary depending on the specific data element, all specifications should be directed at the group that will be performing the development work (in-house or contracted services). All database development specifications share several common parts, including project background and objectives, description of the data deliverables, sources to use, clear description of data content and format of the deliverables, database quality requirements, expected workflow and schedule, definition of roles, and project management process. When these specifications will be used for procurement of contracted services (e.g., included as part of an RFP), there may be specific requirements based on procurement rules. Subtasks include:			
4.8.1. Prepare Draft Specs for Internal Review (for each data element)	7/30/07	4/2/10	3,4
4.8.2 Prepare Final Specifications	8/13/07	4/16/10	3,4
4.9 Start and Execute Initial DB Development Projects (Phase 2, 3)	5/8/06	10/20/09	
After organization and specification development in 4.5 and 4.7 for Phase 2 and 3 projects, the database development projects are initiated and executed. The assigned project manager oversees the work of the team or contracted services and monitors performance, budget and schedule. The PM and Team put in place a tracking and reporting system and tools and procedures for performing quality assurance (QA) and acceptance of products. While quality control is an inherent part of the database development process, QA should be a separate step, preferably performed by another group. Subtasks include:			
4.9.1. Identify Sources for Services	5/8/06	11/16/07	2,3
4.9.2. Assemble Data Sources	7/17/06	3/20/09	2,3
4.9.3. Prepare Procurement Materials (when contractors needed)	7/3/06	5/30/08	2,3
4.9.4. Evaluate and Select Contracted Services	9/11/06	10/17/08	2,3
4.9.5. Launch Projects	10/23/06	11/28/08	2,3

Table 3-3: Summary of GIS Utility Implementation Activities by Track (continued)

Project Task	Start Date	End Date	Phases
TRACK 4: DB PLANNING/DESIGN/DEVELOPMENT, ONGOING MAINTENANCE (continued)	1/2/06	6/28/13	
4.9 Start and Execute Initial DB Development Projects (Phase 2, 3) (continued)	5/8/06	10/20/09	
4.9.6. Carry out DB Development	10/23/06	2/6/09	2,3
4.9.7. Perform QA and Acceptance	12/4/06	7/10/09	2,3
4.9.8. Track and Report on DB Deliverable Status	10/23/06	10/20/09	2,3
4.9.9. Accept and Load DB Products	4/23/07	10/16/09	3,4
4.10. Start/Execute Additional DB Development Projects (Phase 4, 5)	8/13/07	6/28/13	
After organization and specification development in 4.6 and 4.8 for Phase 4 and 5 projects, the database development projects are initiated and executed. The assigned project manager oversees the work of the team or contracted services and monitors performance, budget and schedule. The PM and Team put in place a tracking and reporting system and tools and procedures for performing quality assurance (QA) and acceptance of products. While quality control is an inherent part of the database development process, QA should be a separate step, preferably performed by another group. Subtasks include:			
4.10.1. Identify Services Required	8/13/07	11/27/09	3,4
4.10.2. Assemble Sources	10/22/07	8/19/11	3,4,5
4.10.3. Prepare Procurement Materials (when contractors needed)	10/8/07	6/11/10	3,4
4.10.4. Evaluate and Select Contracted Services	12/17/07	1/7/11	3,4
4.10.5. Launch Project	1/28/08	7/8/11	4,5
4.10.6. Carry out DB Development	1/28/08	8/31/12	4,5
4.10.7. Perform QA and Acceptance	3/10/08	3/1/13	4,5
4.10.8. Track and Report on DB Deliverable Status	1/28/08	6/7/13	4,5
4.11 Overall Monitoring of Database Development	10/23/06	6/28/13	
The GIS Utility Management Unit will receive reports from database project managers and carry out overall tracking of the projects. Subtasks include:			
4.11.1. Prepare Reports from DB Development Projects	10/23/06	6/28/13	2,3,4,5
4.11.2. Receive and Review Reports from DB Development Projects	11/6/06	6/28/13	2,3,4,5
4.11.3. Communicate/Coordinate with Project Teams	10/23/06	6/28/13	2,3,4,5

Table 3-3: Summary of GIS Utility Implementation Activities by Track (continued)

Project Task	Start Date	End Date	Phases
TRACK 4: DB PLANNING/DESIGN/DEVELOPMENT, ONGOING MAINTENANCE (continued)	1/2/06	6/28/13	
4.12 Ongoing Database Maintenance	4/10/06	6/28/13	
As significant portions of the database are completed and posted online for use, they will be subject to ongoing database maintenance. This task includes the identification and assignment of responsibilities for update and the timing of update. Using update applications developed in 5.6 and 5.7, data will be updated by designated custodians, subjected to QA checks, and posted for access through navigatOR.			
Subtasks include:			
4.12.1. Design Overall Process for Data Maintenance	4/10/06	8/25/06	2
4.12.2. Identify and Assign Data Maintenance Responsibilities	5/22/06	7/13/07	2,3
4.12.3. Document Policies for Data Maintenance	6/5/06	8/24/07	2,3
4.12.4. Set Up Technical Procedures for Submitting Updated Data	8/28/06	1/6/12	2,3,4,5
4.12.5. Set Up Procedures for Final QA and Posting	8/28/06	1/6/12	2,3,4,5
4.12.6. Perform Ongoing Updates of Data and Metadata	10/9/06	6/28/13	2,3,4,5
4.12.7. Perform Data QA and Posting for Access	10/9/06	6/28/13	2,3,4,5
TRACK 5: PORTAL AND APPLICATION DESIGN, DEVELOPMENT, DEPLOYMENT	1/2/06	6/28/13	
5.1 Application Design/Development Standards/Best Practices	1/2/06	10/20/06	
Application development will make use of off-the-shelf software packages and development tools available for customizing certain functions for users or system administrators. This development work will make use of a basic set of designed standards and practices to ensure efficient development work, interoperability, and integration of systems. This task defines those basic standards, including an identification of standard programming tools and products, methodologies for development, basic standards for user interfaces and map displays, and standards for technical notation and documentation. Standards are defined early in the development process and then revised as necessary throughout all phases.			
Subtasks include:			
5.1.1. Inventory Current Application Software, Tools, and Practices	1/2/06	3/10/06	2
5.1.2. Evaluate Application Development Standards and Practices	1/2/06	4/7/06	2
5.1.3. Document Application Development Standards and Practices	1/30/06	5/5/06	2
5.1.4. Revise Application Development Standards	3/13/06	10/20/06	2
5.2 Define Reqs for and Plan navigatOR Portal and Services	1/2/06	6/2/06	
The navigatOR portal will be the main "window" for user access to the GIS Utility. Requirements for the portal content, interface, and specific functions will be defined and documented and technical platform (HW, SW) specifications will be defined in detail. A project plan for navigatOR development will be prepared to guide portal development. This plan will include short-term actions for necessary upgrades to the current OGDC to support GIS Utility functions until the navigatOR portal can be developed.			
Subtasks include:			
5.2.1. Define User Requirements	1/2/06	5/5/06	2
5.2.2. Define Technical Platform Requirements	1/2/06	5/5/06	2
5.2.3. Identify Types and Timing of Services	3/27/06	6/2/06	2

Table 3-3: Summary of GIS Utility Implementation Activities by Track (continued)

Project Task	Start Date	End Date	Phases
TRACK 5: PORTAL AND APPLICATION DESIGN, DEVELOPMENT, DEPLOYMENT (continued))	1/2/06	6/28/13	
5.2 Define Reqs for and Plan navigatOR Portal and Services (cont.)	1/2/06	6/2/06	
5.2.4. Prepare Portal Development Plan	1/9/06	5/12/06	2
5.2.5. Identify Steps for OGDC Transition	1/2/06	3/10/06	2
5.3 Interim Modification to OGDC Interface	3/13/06	9/29/06	
Includes all work in the modification of the current GIS clearinghouse (OGDC), including modification of the interface and specific functions, to serve short-term requirements of the GIS Utility until the navigatOR portal can be developed and deployed. Subtasks include:			
5.3.1. Design OGDC Modification	3/13/06	4/14/06	2
5.3.2. Develop and Test Modifications	4/3/06	8/18/06	2
5.3.3. Finalize and Deploy Modified OGDC Interface	7/24/06	9/29/06	2
5.4 Initial Design/Development of navigatOR Portal Interface	1/2/06	5/1/09	
Includes preparation of a detailed project plan, organization of a project team, and development of the navigatOR portal--the first version of the portal to be deployed by the end of Phase 2 or early Phase 3. Following standards prepared in 5.1, software and programming tools will be confirmed and development will follow a structured methodology from design, prototype development and testing steps, testing in a pilot setting, and final modification and deployment in an operational setting. To the extent possible, the portal will make use of off-the-shelf functions with required customization. The portal will be used to invoke specific applications from other development projects. Use of the portal will be monitored, and minor adjustments will be made as needed. Subtasks include:			
5.4.1. Organize Design Team	1/2/06	5/5/06	2
5.4.2. Identify Technical Tools and Programming Standards	1/23/06	5/26/06	2
5.4.3. Design Functional Components and Layout	3/27/06	6/16/06	2
5.4.4. Develop and Test Prototype	5/22/06	10/6/06	2
5.4.5. Revise Prototype	9/25/06	12/1/06	2
5.4.6. Identify and Enable Links With Other Web Services	7/31/06	11/17/06	2
5.4.7. Deploy in Pilot Environment	10/9/06	12/15/06	2
5.4.8. Review Pilot Results	11/20/06	1/12/07	2
5.4.9. Revise Portal Interface	1/1/07	2/23/07	2
5.4.10. Prepare User and Technical Documentation	6/5/06	3/9/07	2
5.4.11. Deploy Initial Operational Portal	2/26/07	3/9/07	2
5.4.12. Identify Potential Fixes and Adjustments	5/7/07	4/3/09	2
5.4.13. Make, Test, and Deploy Adjustments	6/4/07	5/1/09	2

Table 3-3: Summary of GIS Utility Implementation Activities by Track (continued)

Project Task	Start Date	End Date	Phases
TRACK 5: PORTAL AND APPLICATION DESIGN, DEVELOPMENT, DEPLOYMENT (continued))	1/2/06	6/28/13	
5.5 Enhanced navigatOR Portal Design/Development (Phase 4, 5)	9/21/09	12/16/11	
After substantial use of the portal in Phase 3, there will likely be interest in major enhancements to improve the interface and/or include additional functionality. Portal use during Phase 3 will be reviewed and requirements for enhancement will be evaluated. Enhancements will follow a structured design and development process as described in 5.4. Subtasks include:			
5.5.1. Evaluate Requirements for Major Portal Revision	9/21/09	4/16/10	4
5.5.2. Design Portal Enhancements	4/19/10	8/20/10	4
5.5.3. Develop and Test Revised Portal	8/23/10	4/22/11	4
5.5.4. Revise Documentation	9/27/10	7/1/11	4
5.5.5. Deploy Enhanced Portal	3/14/11	12/16/11	4,5
5.6 Initial Data Update/Submittal App. Design/Dev. (Phase 2, 3)	1/16/06	11/27/09	
Includes all planning, design, and development for functions supporting update of individual Framework data elements. Applications for update will use off-the-shelf functions to the greatest extent possible with sufficient customization to provide an effective interface and specific functions needed by users. This task includes the development of update applications for each data update task (for Very High and High Priority data elements) in Phase 2 and 3. Development work follows a structured approach from design, prototype development and testing, and final development and deployment. This work also includes technical and user documentation. This task also includes the development of applications for data custodians to submit updated data for posting on navigatOR. Subtasks include:			
5.6.1. Confirm Framework Data Elements for Initial Work	1/16/06	4/7/06	2
5.6.2. Define Workflow Steps for Update (by data element)	4/10/06	3/7/08	2,3
5.6.3. Document Sources and Functions for Update	5/8/06	4/4/08	2,3
5.6.4. Identify Existing Software Tools and Customization Needed	5/8/06	4/4/08	2,3
5.6.5. Design Customized Applications for Update	6/5/06	5/2/08	2,3
5.6.6. Develop and Test Prototypes	7/17/06	3/20/09	2,3
5.6.7. Finalize Customized Functions	8/28/06	5/1/09	2,3
5.6.8. Design Processes for Update Submittals	6/5/06	5/2/08	2,3
5.6.9. Develop Web-based Functions for Data Submittal or Replication	7/17/06	3/20/09	2,3
5.6.10. Test and Finalize Data Submittal/Replication Functions	8/28/06	5/1/09	2,3
5.6.11. Prepare User and Technical Documentation	7/17/06	5/29/09	2,3
5.6.12. Monitor Use and Make Adjustments As Needed	8/28/06	11/27/09	2,3,4

Table 3-3: Summary of GIS Utility Implementation Activities by Track (continued)

Project Task	Start Date	End Date	Phases
TRACK 5: PORTAL AND APPLICATION DESIGN, DEVELOPMENT, DEPLOYMENT (continued))	1/2/06	6/28/13	
5.7 Additional Data Update/Submittal App Design/Dev. (Phase 4, 5)	9/21/09	6/28/13	
Includes similar design and development work as performed in 5.6 for additional data update applications in Phase 4 and 5. The work will follow the same structured design and development process leading to deployment of the applications. Subtasks include:			
5.7.1. Identify Additional Data Elements and Define Workflow	9/21/09	4/1/11	4
5.7.2. Document Sources and Functions for Update	11/16/09	7/20/12	4,5
5.7.3. Design Customized Applications for Update	11/16/09	3/2/12	4,5
5.7.4. Develop and Test Prototypes	12/14/09	8/17/12	4,5
5.7.5. Finalize Customized Functions	12/14/09	1/4/13	4,5
5.7.6. Deploy Web-based Services for Data Submittal or Replication	2/8/10	12/21/12	4,5
5.7.7. Prepare User and Technical Documentation	12/14/09	3/15/13	4,5
5.7.8. Monitor Use and Adjustments As Needed	11/26/12	6/28/13	5
5.8. Initial Geographic Data QA/Posting App Design/Dev. (Phase 2, 3)	5/8/06	7/10/09	
Includes all planning, design, and development of applications and procedures for final quality assurance (QA) and posting of data that has been updated and submitted by designated custodians (using tools and procedures defined in 5.6 for Very High and High Priority data elements in Phase 2 and 3). The workflow will be documented, and automated QA functions will be developed for each data element. The QA applications will identify any problems (and perhaps apply fixes to certain types of errors). After final acceptance, the updated data will be posted to navigatOR. Work will include the development of tracking and reporting functions. Subtasks include:			
5.8.1. Define Workflow For QA and Posting	5/8/06	4/4/08	2,3
5.8.2. Confirm Data Quality Specifications for Data Elements	5/8/06	6/13/08	2,3
5.8.3. Identify Automated Checks and Off-the-Shelf Tools	5/8/06	6/13/08	2,3
5.8.4. Design Custom QA Applications	6/19/06	5/16/08	2,3
5.8.5. Develop and Test QA Prototypes	6/19/06	2/20/09	2,3
5.8.6. Finalize QA and Data Posting Applications	7/31/06	6/12/09	2,3
5.8.7. Design and Develop Data QA Tracking Applications	6/19/06	5/1/09	2,3
5.8.8. Document Applications and Procedures	8/28/06	7/10/09	2,3
5.9. Additional Geo Data QA/Posting App Design/Dev. (Phase 4, 5)	11/2/09	1/18/13	
Includes the development of additional applications to support data QA and posting for Framework data elements completed in Phase 4 and 5. Subtasks include:			
5.9.1. Confirm Data Quality Specifications for Data Elements	11/2/09	5/13/11	3
5.9.2. Identify Automated Checks and Off-the-Shelf Tools	11/2/09	9/30/11	3,4

Table 3-3: Summary of GIS Utility Implementation Activities by Track (continued)

Project Task	Start Date	End Date	Phases
TRACK 5: PORTAL AND APPLICATION DESIGN, DEVELOPMENT, DEPLOYMENT (continued))	1/2/06	6/28/13	
5.9. Additional Geo Data QA/Posting App Design/Dev. (Phase 4, 5) (continued)	11/2/09	1/18/13	
5.9.3. Design Custom QA Applications	12/14/09	1/20/12	3,4,5
5.9.4. Develop and Test QA Prototypes	1/25/10	9/28/12	3,4,5
5.9.5. Finalize QA and Data Posting Applications	3/8/10	11/9/12	3,4,5
5.9.6. Design and Develop Data QA Tracking Applications	3/22/10	7/6/12	3,4,5
5.9.7. Document Applications and Procedures	3/8/10	1/18/13	3,4,5
5.10. Initial Data Search and Viewing Applications	2/13/06	6/30/09	
Viewing and searching functions are the foundation of the navigatOR portal. This includes all query capability allowing users to quickly access data by content and geographic area and then to use interactive functions to control the display of data. These applications will be accessible initially through menu selections and will display dataset-level metadata to access specific Framework data elements. These capabilities also allow for feature/attribute queries and all basic functions for map display control. The development work will use off-the-shelf software functions with necessary customization. A structured methodology will be followed from a definition of requirements, prototype development and testing, final development, and documentation. Subtasks include:			
5.10.1. Identify Initial Search and Viewing Functions	3/27/06	7/14/06	2
5.10.2. Identify Off-the-Shelf Tools to Enable Functions	4/10/06	7/28/06	2
5.10.3. Identify Customization Requirements	2/13/06	6/16/06	2
5.10.4. Design Customized Functions	2/27/06	6/30/06	2
5.10.5. Develop and Test Prototype	6/19/06	11/3/06	2
5.10.6. Finalize Customized Functions and Incorporate into navigatOR	7/17/06	12/15/06	2
5.10.7. Prepare User and Technical Documentation	6/5/06	6/1/07	2
5.10.8. Monitor Use and Make Adjustments As Needed	12/18/06	6/30/09	2,3
5.11 Enhanced Data Search and Viewing Applications	9/9/09	6/28/13	
After substantial use of the portal in Phase 3 and new developments in the field (particularly related to Web-based search tools), there will likely be interest in major enhancements of search and viewing capabilities. Ideas for enhancements will be evaluated and new functionality will be designed and developed following a structured development approach. Subtasks include:			
5.11.1. Identify Search and Viewing Enhancements	9/9/09	6/15/10	4
5.11.2. Identify Customization Requirements	11/18/09	6/15/10	4
5.11.3. Design Customized Functions	5/19/10	1/18/11	4
5.11.4. Develop and Test Prototype	12/8/10	9/13/11	4,5
5.11.5. Finalize Customized Functions and Incorporate into navigatOR	8/31/11	1/17/12	4,5
5.11.6. Prepare User and Technical Documentation	12/8/10	1/31/12	4,5
5.11.7. Monitor Use and Make Adjustments As Needed	1/18/12	6/28/13	4,5

Table 3-3: Summary of GIS Utility Implementation Activities by Track (continued)

Project Task	Start Date	End Date	Phases
TRACK 5: PORTAL AND APPLICATION DESIGN, DEVELOPMENT, DEPLOYMENT (continued))	1/2/06	6/28/13	
5.12 Data Extract, Transformation Download Service Design/Dev.	3/27/06	6/28/13	
The navigatOR portal will include user applications for extracting GIS data and downloading data for local use (in accordance with any terms limiting or restricting use). Applications, sometimes referred to as "clip and zip," will allow users to select a geographic area and specific data elements for extract and download (via email or FTP transfer). Using off-the-shelf tools for data transliteration, users will also be able to select several different data formats for download. The applications may also allow the quick download of several standard data products (already prepared for download). Development work follows structured design, and development approach culminates in deployed applications with technical and user documentation. Subtasks include:			
5.12.1. Identify Data Extract Functional Requirements	3/27/06	7/28/06	2
5.12.2. Identify Off-the-Shelf Tools to Enable Functions	3/27/06	7/28/06	2
5.12.3. Identify Customization Requirements	5/22/06	8/25/06	2
5.12.4. Design Customized Functions	6/19/06	9/22/06	2
5.12.5. Develop and Test Prototype	8/28/06	12/15/06	2
5.12.6. Finalize Customized Functions and Incorporate into Portal	12/4/06	2/9/07	2
5.12.7. Prepare User and Technical Documentation	9/25/06	2/23/07	2
5.12.8. Incorporate Application into Portal	1/15/07	2/23/07	2
5.12.9. Monitor Use and Make Adjustments As Needed	2/26/07	6/28/13	2,3,4,5
5.13 Geocoding/Incident Mapping Service Design and Development	4/24/06	6/28/13	
Includes the design and development of a special automated service for geocoding of non-GIS databases, i.e., cleansing and proper formatting of databases with spatially referenced data so that they may be used consistently in geographic analysis and mapping applications. Often this includes the appending or correction of street address fields to meet format and data quality requirements. Packaged software with appropriate configuration and customization tools would be used. This category of applications also includes address matching and other incident mapping functions to generate custom maps from the geocoded data. This task includes all work in defining requirements, acquiring and installing off-the-shelf software, customizing applications, and defining a process for handling requests for service. Much of the work will be automated, but some support from the GIS Utility Management Unit will be required. Subtasks include:			
5.13.1. Identify Geocoding and Incident Mapping Requirements	4/24/06	8/25/06	2
5.13.2. Identify Off-the-Shelf Tools to Enable Functions	4/24/06	8/25/06	2
5.13.3. Identify Customization Requirements	6/19/06	9/22/06	2
5.13.4. Design Customized Functions	7/17/06	10/20/06	2
5.13.5. Develop and Test Prototype	9/25/06	1/12/07	2
5.13.6. Finalize Customized Functions	1/1/07	3/9/07	2
5.13.7. Prepare User and Technical Documentation	10/23/06	3/23/07	2
5.13.8. Deploy/Provide Service	2/12/07	3/23/07	2
5.13.9. Monitor Use and Make Adjustments As Needed	3/26/07	6/28/13	2,3,4,5

Table 3-3: Summary of GIS Utility Implementation Activities by Track (continued)

Project Task	Start Date	End Date	Phases
TRACK 5: PORTAL AND APPLICATION DESIGN, DEVELOPMENT, DEPLOYMENT (continued))	1/2/06	6/28/13	
5.14 Special Application Design and Development	6/19/06	6/28/13	
There are potentially a large range of special applications that could be developed and made accessible by GIS Utility users, either at the Core Data Center or by partner organizations supporting Web services and using data available through the GIS Utility. The Conceptual Design identifies several of these. This task includes all design and development tasks for any special applications that go beyond the main data management and access applications defined in other tasks. Subtasks include:			
5.14.1. Identify Special Web-based Applications	6/19/06	10/28/11	2,3,4
5.14.2. Identify Off-the-Shelf Software	6/19/06	10/28/11	2,3,4
5.14.3. Identify Customization Requirements	8/14/06	3/2/12	2,3,4,5
5.14.4. Design Customized Applications	12/18/06	7/6/12	2,3,4,5
5.14.5. Develop and Test Prototype	1/29/07	10/26/12	2,3,4,5
5.14.6. Finalize Customized Functions	5/7/07	2/1/13	2,3,4,5
5.14.7. Prepare User and Technical Documentation	3/26/07	5/10/13	2,3,4,5
5.14.8. Deploy Special Application	2/11/08	6/28/13	3,4,5
5.14.9. Monitor Use and Make Adjustments As Needed	11/24/08	6/28/13	3,4,5
TRACK 6: EDUCATION, OUTREACH, AND USER SUPPORT	1/2/06	6/28/13	
6.1 User Group Organization and Support	2/13/06	6/28/13	
The GIS Utility Management Unit will have the lead role in setting up the User Group and recruiting members and getting activities started. User Group members will then be responsible for selected leadership roles and defining operating procedures. The User Group will be activated and the GIS Utility Management Unit will provide administrative support and communicate regularly with the User Group. Subtasks include:			
6.1.1. Define Purpose and Structure	2/13/06	8/25/06	2
6.1.2. Recruit/Select Members	3/13/06	9/8/06	2
6.1.3. Initiate User Group	8/14/06	9/22/06	2
6.1.4. Define Operating Procedures	9/11/06	11/17/06	2
6.1.5. Ongoing User Group Activities	9/25/06	6/28/13	2,3,4,5
6.2. Initial Education and Promotion	1/2/06	3/16/07	
In Phase 2, the GIS Utility Management Unit, along with the Board and User Group, will actively educate GIS users statewide and promote support of and participation in the GIS Utility. This task includes the preparation of educational materials and all activities involved in identifying education opportunities, distributing materials, preparing for and conducting special meetings and presentations, and other initial education and promotion activities. Subtasks include:			
6.2.1. Prepare Initial Briefing Materials	1/2/06	3/10/06	2

Table 3-3: Summary of GIS Utility Implementation Activities by Track (continued)

Project Task	Start Date	End Date	Phases
TRACK 6: EDUCATION, OUTREACH, AND USER SUPPORT (cont.)	1/2/06	6/28/13	
6.2. Initial Education and Promotion (continued)	1/2/06	3/16/07	
6.2.2. Identify Opportunities and Venues for Education	1/2/06	10/6/06	2
6.2.3. Distribute Materials	1/16/06	3/9/07	2
6.2.4. Plan and Conduct Educational and Promotion Programs	1/23/06	3/16/07	2
6.3 Senior Management Briefings	2/27/06	6/28/13	
Briefing and communications with senior officials (elected officials and senior management at federal, state, and local levels) will be conducted throughout the development process by Board members, members of the GIS Utility Management Unit, or users. This task includes all preparing briefing materials and conducting management briefings. Subtasks include:			
6.3.1. Prepare Briefing Materials	2/27/06	6/28/13	2,3,4,5
6.3.2. Arrange for/Schedule Briefings	3/27/06	6/28/13	2,3,4,5
6.3.3. Conduct Briefings	3/27/06	6/28/13	2,3,4,5
6.4 Staff Professional Development	4/20/06	6/28/13	
The GIS Utility Manager will have the lead role in designing a professional development program for the GIS Management Unit team. This will include the identification of training and education needs, specific offerings, and a basic approach for seeing that team members participate in all types of professional development activities: professional reading, seminars, computer-based training, workshops, training courses, etc. Participation will be monitored. Subtasks include:			
6.4.1. Design PD Program for GIS Utility Team Members	4/20/06	9/6/06	2
6.4.2. Participate in PD Opportunities	7/27/06	6/28/13	2,3,4,5
6.4.3. Monitor and Adjust Program	7/27/06	6/28/13	2,3,4,5
6.5 Conference Participation	4/20/06	6/28/13	
The GIS Utility Management Unit, as well as the broader user community, will participate in conferences sponsored by state and national organizations active in GIS and related fields. Conference participation includes attendance, workshop participation or instruction, session presentations, or a role in conference organization. Subtasks include:			
6.5.1. Identify Conferences for Participation	4/20/06	3/13/13	2,3,4,5
6.5.2. Distribute Information on Conferences to Staff and User Community	5/18/06	4/10/13	2,3,4,5
6.5.3. Encourage Conference Participation	5/18/06	6/28/13	2,3,4,5
6.5.4. Prepare for Participation	6/15/06	6/28/13	2,3,4,5
6.5.5. Attend/Participate in Conferences	7/13/06	6/28/13	2,3,4,5

Table 3-3: Summary of GIS Utility Implementation Activities by Track (continued)

Project Task	Start Date	End Date	Phases
TRACK 6: EDUCATION, OUTREACH, AND USER SUPPORT (cont.)	1/2/06	6/28/13	
6.6 Statewide GIS Education and Training Program	9/11/06	6/28/13	
The GIS Utility initiative includes an underlying goal to increase the level of understanding about GIS and skills for using GIS technology for the entire user community in Oregon. Meeting this goal means supporting and augmenting existing educational and training programs and activities at individual organizations. The GIS Utility Management Unit, with approval by the Board and help from appropriate Committees or Work Groups, will plan and sponsor education for statewide users, channel financial support in some cases, and help coordinate existing programs so that they most efficiently meet the needs of the largest number of users. Subtasks include:			
6.6.1. Evaluate Statewide Education and Training Needs	9/11/06	11/17/06	2
6.6.2. Examine/Document Programs and Sources	9/11/06	11/17/06	2
6.6.3. Develop Partnerships and Program Offerings	10/23/06	1/19/07	2
6.6.4. Promote Education and Training	11/27/06	10/24/08	2,3
6.6.5. Monitor Education and Training Activity	2/19/07	6/28/13	2,3,4,5
6.7 User Help Desk and General User Support	1/2/06	6/28/13	
The GIS Utility Management Unit will put in place a well-managed user support service to answer user questions about the GIS Utility, use of the navigatOR portal, and GIS technology in general. The "help desk" service establishes a call in number, system for logging questions, and an automated tool to submit questions and provide responses via email or phone. User support also includes coordination of resources outside the GIS Utility Management Unit, including a network of user contacts and vendor resources for technical support. Subtasks include:			
6.7.1. Design Program for User Support	2/13/06	6/30/06	2
6.7.2. Assign Resources for User Support	3/27/06	8/11/06	2
6.7.3. Set-up Tools for User Support	3/27/06	8/11/06	2
6.7.4. Set-up and Maintain Network of GIS Professionals	8/14/06	6/28/13	2,3,4,5
6.7.5. Provide Ongoing Technical Support to Users	1/2/06	6/28/13	2,3,4,5
6.8 External Communications	1/2/06	6/28/13	
Includes management, preparation, and all handling of communications with organizations and groups outside of the GIS Utility organizational structure, including public sector organizations, private companies, the media, etc. These external communications are subject to Board policies and may, in some cases, be directed specifically by the Board. Subtasks include:			
6.8.1. Prepare/Send Standard Participant Communications	1/2/06	6/28/13	2,3,4,5
6.8.2. Prepare and Distribute Media Releases	1/2/06	6/28/13	2,3,4,5
6.8.3. Presentations at Special Meetings	1/2/06	6/28/13	2,3,4,5

3.4 BUDGET AND FUNDING

A long-term budget has been prepared which takes into account all aspects of the GIS Utility development and operation in such categories as database development, personnel, system costs, and a variety of ongoing operational costs. These categories are explained in Table 3-4. Projected costs are summarized in Table 3-5 and a detailed cost itemization is provided in Appendix A.

Table 3-4: Explanation of GIS Utility Cost Categories

Cost Elements	Description
A. Computer Hardware	All purchases of computer hardware, including servers, mass storage, and peripheral devices.
B. Computer Software	All purchases of software licenses, including server and desktop GIS, middleware, special applications, database management, development software, and system administration software.
C. Hardware Maintenance	Costs for annual contracts for hardware maintenance.
D. Software Support	Costs for annual contracts for software support and maintenance.
E. Communications Equipment & Services	Costs for local and wide area network hardware (routers, switches, firewalls) and network services.
F. Consulting/ Technical Services	Costs for services from consultants or technical support companies to support technical design and development, system set-up, and related program management support.
G. Database Development and Maintenance	All aspects of data conversion, compilation, and integration for full development of Framework data. Also includes costs for management of conversion contracts, associated quality assurance of data, and ongoing data update.
H. Application Development and Deployment	Service specifically for the design and development of special applications to support the GIS Utility—including portal development, special GIS functionality, and other special applications to support GIS Utility administration.
I. Personnel	Costs for Core Center staff—including management, technical, and support people. Includes costs for full-time staff and for temporary or intern staff.
J. Equipment and Facilities	Non-computer equipment and facility costs. Includes furniture, copying machine, and supplies. Also includes costs to DAS for hosting and service charges at the new consolidated computer center.
K. Program Admin. and Operations	Costs for meetings, special programs, professional travel, and promotional and educational materials.
L. Training/Education	All costs for vendor training, workshops, conferences, and special training seminars. Budget covers all costs for Core Center staff and an allocation to support statewide user education and training.
M. Regional GIS Utility Centers	Costs for the planning, set-up, and operation of three Regional Centers. Includes costs for facilities, hardware, software, staff, and ongoing operations.
N. Technology Development Support/Assistance	Includes an allocation of funds to support statewide GIS development—particularly aimed at low-resourced portions of the state that need assistance in network and technology acquisition and start-up assistance.

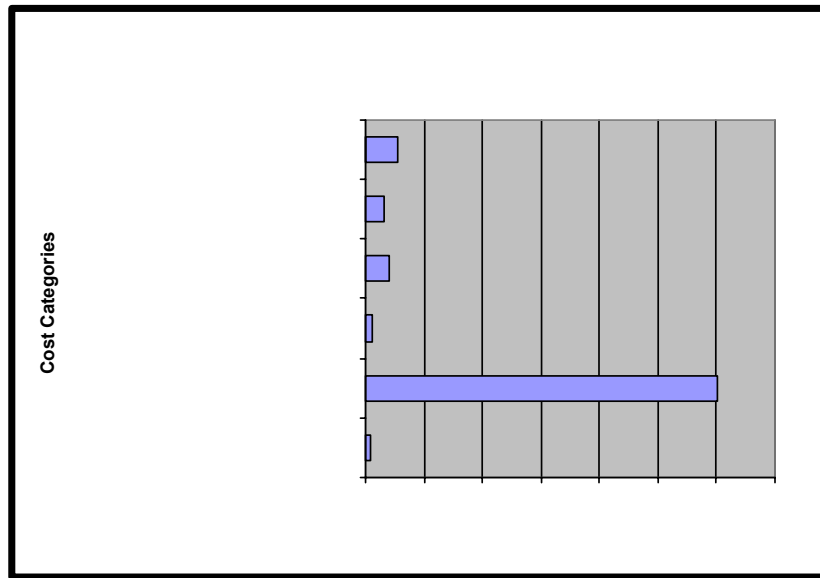
The total projected cost (over ten years) is about \$173 million with most of the costs occurring in FY 05-06 to FY 10-11. The costs presented in Table 3-5 do not make explicit reference to specific parties that will incur costs, provide funding, or manage expenditures for various parts of GIS Utility development. While it is recommended that GEO be assigned overall operational management responsibilities, many of the costs refer to efforts now under way or which should be initiated and managed by other organizations participating in the GIS Utility program. This section also does not cite specific funding sources, although it is understood that additional state and regional fund allocations will be limited, and more innovative funding approaches will be necessary, including better leveraging and channeling of existing expenditures by federal state, regional, and local organizations. The *GIS Utility Business Case* (June 2005) discusses these issues in more detail.

Table 3-5: GIS Utility Development and Operational Cost Summary

Cost Elements	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	FY 10-11	FY 11-12	FY 12-13	FY 13-14	FY 15-16	TOTAL
A. Computer Hardware	\$0	\$20	\$50	\$25	\$50	\$25	\$25	\$50	\$25	\$25	\$295
B. Computer Software	\$23	\$100	\$157	\$140	\$127	\$10	\$0	\$47	\$0	\$0	\$604
C. Hardware Maintenance	\$0	\$1	\$3	\$4	\$3	\$3	\$1	\$3	\$4	\$2	\$23
D. Software Support	\$24	\$37	\$58	\$66	\$60	\$48	\$23	\$24	\$31	\$21	\$391
E. Communications Equip. & Services	\$20	\$20	\$21	\$16	\$17	\$17	\$17	\$18	\$18	\$19	\$183
F. Consulting/Technical Services	\$300	\$300	\$300	\$200	\$100	\$100	\$0	\$0	\$0	\$0	\$1,300
G. Database Dev. and Maintenance	\$16,018	\$21,948	\$30,724	\$20,129	\$12,904	\$9,020	\$7,391	\$1,583	\$331	\$339	\$120,387
H. Application Development	\$300	\$300	\$200	\$200	\$150	\$0	\$0	\$0	\$0	\$0	\$1,150
I. Personnel	\$140	\$458	\$674	\$770	\$789	\$803	\$823	\$843	\$864	\$885	\$7,051
J. Equipment and Facilities	\$275	\$436	\$562	\$614	\$630	\$645	\$662	\$678	\$695	\$712	\$5,909
K. Program Admin. and Operations	\$30	\$40	\$50	\$51	\$53	\$54	\$55	\$57	\$58	\$59	\$507
L. Training/Education	\$67	\$89	\$111	\$115	\$118	\$121	\$124	\$127	\$130	\$133	\$1,134
M. Regional GIS Utility Centers	\$0	\$505	\$685	\$369	\$898	\$597	\$612	\$627	\$642	\$658	\$5,594
N. Tech. Development Support/Assistance	\$0	\$2,250	\$3,375	\$5,063	\$6,075	\$4,253	\$2,977	\$2,084	\$1,459	\$1,021	\$5,594
Cost Summary:	\$17,198	\$26,503	\$36,969	\$27,762	\$21,972	\$15,697	\$12,709	\$6,140	\$4,257	\$3,875	\$173,082

In graphic terms, GIS Utility development and operational costs are depicted in Figure 3-1. This chart shows that database development and maintenance is the main cost component and focus of the GIS Utility. The primary goal, for an initial six-year period, is to develop detailed geographic data sets with statewide coverage to support all users.

Figure 3-1: Summary of GIS Utility Development and Operational Costs



APPENDIX A
DETAILED GIS UTILITY COSTS

Table A-1 provides detailed cost projections for GIS Utility development and operation over a ten-year period. Note: The phased approach to implementation calls for completion of most development work (including Framework database development) within a six-year period.

Table A-1: Detailed Projections of GIS Utility Development and Operational Costs

GIS Utility Development and Operational Costs (in thousands of \$)											
Cost Elements	FY05-06	FY06-07	FY07-08	FY08-09	FY09-10	FY10-11	FY11-12	FY12-13	FY13-14	FY15-16	TOTAL
A. Computer Hardware Purchase											
Servers			\$25.0		\$25.0			\$25.0			\$75.0
Mass Storage	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Desktop Computers											\$0.0
Peripheral Devices		\$10.0	\$15.0	\$15.0	\$15.0	\$15.0	\$15.0	\$15.0	\$15.0	\$15.0	\$130.0
Hardware Upgrades		\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$90.0
Hardware/Maintenance Retired*						\$20.0				\$20.0	\$40.0
Subtotal A:	\$0.0	\$20.0	\$50.0	\$25.0	\$50.0	\$25.0	\$25.0	\$50.0	\$25.0	\$25.0	\$295.0
B. Computer Software for Core Center											
RDBMS Software											\$0.0
Server-based Core GIS Software		\$10.0	\$10.0		\$10.0			\$10.0			\$40.0
Web-based GIS Software			\$7.0		\$7.0			\$7.0			\$21.0
Desktop Core GIS Software	\$3.0	\$15.0	\$15.0	\$15.0				\$15.0			\$63.0
Special Application GIS Software	\$10.0	\$50.0	\$100.0	\$100.0	\$100.0	\$10.0		\$15.0			\$385.0
Middleware/Integration Software		\$10.0	\$10.0	\$10.0							\$30.0
System/Network Administration Software		\$5.0	\$5.0	\$5.0							\$15.0
Other Software	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0						\$50.0
Software License/Support Retired*				\$15.0			\$15.0			\$15.0	\$45.0
Subtotal B:	\$23.0	\$100.0	\$157.0	\$140.0	\$127.0	\$10.0	\$0.0	\$47.0	\$0.0	\$0.0	\$604.0
C. Hardware Maintenance	\$0.0	\$0.6	\$2.7	\$3.8	\$3.0	\$3.2	\$1.1	\$3.0	\$3.8	\$1.7	\$22.7
D. Software Support	\$24.3	\$36.6	\$57.7	\$65.9	\$59.7	\$48.4	\$22.5	\$23.7	\$31.4	\$20.5	\$390.7
E. Core Center Network Equipment and Services											
Communications Equipment											\$0.0
LAN/WAN Set-up	\$5.0	\$5.0	\$5.0								\$15.0
Web/Internet Hosting and Services	\$15.0	\$15.4	\$15.8	\$16.2	\$16.6	\$17.0	\$17.4	\$17.8	\$18.3	\$18.7	\$168.1
Other Hardware/Network											\$0.0
Subtotal E:	\$20.0	\$20.4	\$20.8	\$16.2	\$16.6	\$17.0	\$17.4	\$17.8	\$18.3	\$18.7	\$183.1
F. Consulting and Technical Services											
Program Planning/Management Support	\$100.0	\$100.0	\$100.0								\$300.0
Technical Design/Development Services	\$200.0	\$200.0	\$200.0	\$200.0	\$100.0	\$100.0					\$1,000.0
Subtotal F:	\$300.0	\$300.0	\$300.0	\$200.0	\$100.0	\$100.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1,300.0

*Shows periodic retirement of older HW and SW. Dollar amount then subtracted from calculation of annual maintenance and support contract costs.

Table A-1: Detailed Projections of GIS Utility Development and Operational Costs (continued)

GIS Utility Development and Operational Costs (in thousands of \$)											
Cost Elements	FY05-06	FY06-07	FY07-08	FY08-09	FY09-10	FY10-11	FY11-12	FY12-13	FY13-14	FY15-16	TOTAL
G. Database Development, Acquisition, Maintenance											
Detailed DB Design/QA/Set-up	\$1,520.8	\$2,076.0	\$2,817.1	\$1,803.2	\$1,110.3	\$739.8	\$553.9	\$35.0	\$35.9	\$36.8	\$10,728.7
Contracted Data Conversion-VH	\$15,207.9	\$15,207.9	\$15,207.9	\$5,069.3							\$50,693.0
Contracted Data Conversion-H		\$1,859.2	\$5,577.6	\$5,577.6	\$3,718.4	\$1,859.2					\$18,592.0
Contracted Data Conversion-M		\$3,692.6	\$7,385.1	\$7,385.1	\$7,385.1	\$5,538.8	\$5,538.8				\$36,925.5
Contracted Data Conversion-L			\$900.0	\$900.0	\$900.0	\$900.0	\$1,200.0	\$1,200.0			\$6,000.0
In-house DB Dev/Prep Costs	\$760.4	\$1,038.0	\$1,453.5	\$946.6	\$600.2	\$414.9	\$336.9	\$60.0	\$0.0	\$0.0	\$5,610.5
Database Update Services	\$50.0	\$150.0	\$200.0	\$250.0	\$300.0	\$307.5	\$315.2	\$323.1	\$331.1	\$339.4	\$2,566.3
Subtotal G:	\$16,018.3	\$21,947.6	\$30,724.1	\$20,128.6	\$12,903.7	\$9,020.4	\$7,391.0	\$1,583.1	\$331.1	\$339.4	\$120,387.3
H. Application Development											
Core System Services	\$200.0	\$200.0	\$100.0	\$100.0	\$50.0						\$650.0
Special Application Development	\$100.0	\$100.0	\$100.0	\$100.0	\$100.0						\$500.0
Subtotal H:	\$300.0	\$300.0	\$200.0	\$200.0	\$150.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1,150.0
I. Personnel (1)											
Management Positions	\$0.0	\$105.0	\$107.6	\$110.3	\$113.1	\$115.9	\$118.8	\$121.8	\$124.8	\$127.9	\$1,045.2
Technical Positions	\$80.0	\$242.0	\$408.1	\$498.3	\$510.7	\$523.5	\$536.6	\$550.0	\$563.7	\$577.8	\$4,490.6
Clerical/Support Positions	\$45.0	\$91.1	\$138.4	\$141.9	\$145.4	\$149.0	\$152.8	\$156.6	\$160.5	\$164.5	\$1,345.2
Intern/Co-op Staff	\$15.0	\$20.0	\$20.0	\$20.0	\$20.0	\$15.0	\$15.0	\$15.0	\$15.0	\$15.0	\$170.0
Contract Staff											\$0.0
Subtotal I:	\$140.0	\$458.1	\$674.1	\$770.4	\$789.2	\$803.4	\$823.1	\$843.3	\$864.0	\$885.3	\$7,051.0
J. Equipment, Facilities, Hosting, Physical Overhead											
Supplies/Equipment	\$225.0	\$384.4	\$509.3	\$560.5	\$574.5	\$588.8	\$603.6	\$618.7	\$634.1	\$650.0	\$5,348.8
CNIC Hosting/Service Charges	\$50.0	\$51.3	\$52.5	\$53.8	\$55.2	\$56.6	\$58.0	\$59.4	\$60.9	\$62.4	\$560.2
Subtotal J:	\$275.0	\$435.6	\$561.8	\$614.3	\$629.7	\$645.4	\$661.5	\$678.1	\$695.0	\$712.4	\$5,908.9

Table A-1: Detailed Projections of GIS Utility Development and Operational Costs (continued)

GIS Utility Development and Operational Costs (in thousands of \$)											
Cost Elements	FY05-06	FY06-07	FY07-08	FY08-09	FY09-10	FY10-11	FY11-12	FY12-13	FY13-14	FY15-16	TOTAL
K. Program Administration and Operational Support											
Meeting/Event Costs	\$10.0	\$10.0	\$15.0	\$15.4	\$15.8	\$16.2	\$16.6	\$17.0	\$17.4	\$17.8	\$151.0
Travel	\$10.0	\$15.0	\$20.0	\$20.5	\$21.0	\$21.5	\$22.1	\$22.6	\$23.2	\$23.8	\$199.7
News/Promotional Materials	\$10.0	\$15.0	\$15.0	\$15.4	\$15.8	\$16.2	\$16.6	\$17.0	\$17.4	\$17.8	\$156.0
Subtotal K:	\$30.0	\$40.0	\$50.0	\$51.3	\$52.5	\$53.8	\$55.2	\$56.6	\$58.0	\$59.4	\$506.8
L. Training/Education											
Vendor Training Courses	\$5.0	\$6.0	\$7.5	\$7.7	\$7.9	\$8.1	\$8.3	\$8.5	\$8.7	\$8.9	\$76.5
Training/Education Materials	\$6.0	\$8.0	\$9.0	\$9.2	\$9.5	\$9.7	\$9.9	\$10.2	\$10.4	\$10.7	\$92.6
Conferences and Workshops	\$6.0	\$10.0	\$14.0	\$16.0	\$16.4	\$16.8	\$17.2	\$17.7	\$18.1	\$18.6	\$150.8
University or Special Courses											\$0.0
Training Support for GIS Community	\$20.0	\$25.0	\$30.0	\$30.8	\$31.5	\$32.3	\$33.1	\$33.9	\$34.8	\$35.7	\$307.1
Subtotal L:	\$67.0	\$89.0	\$110.5	\$114.9	\$117.8	\$120.7	\$123.7	\$126.8	\$130.0	\$133.3	\$1,133.8
M. Regional Resource Centers (2)											
Hardware/Software		\$200.0	\$200.0		\$200.0	\$15.0	\$15.0	\$15.0	\$15.0	\$15.0	\$675.0
Facilities		\$125.0	\$125.0		\$130.0						\$380.0
Ongoing Operations		\$50.0	\$100.0	\$102.5	\$155.1	\$158.9	\$162.9	\$167.0	\$171.2	\$175.4	\$1,243.0
Staffing		\$130.0	\$260.0	\$266.5	\$413.2	\$423.5	\$434.1	\$444.9	\$456.1	\$467.5	\$3,295.7
Subtotal M:	\$0.0	\$505.0	\$685.0	\$369.0	\$898.2	\$597.4	\$612.0	\$626.9	\$642.2	\$657.9	\$5,593.7
N. Technology Development Cost Support (3)											
Hardware/Software Acquisition	\$1,500.0	\$2,250.0	\$3,375.0	\$4,050.0	\$2,835.0	\$1,984.5	\$1,389.2	\$972.4	\$680.7		\$19,036.7
Network Development	\$750.0	\$1,125.0	\$1,687.5	\$2,025.0	\$1,417.5	\$992.3	\$694.6	\$486.2	\$340.3		\$9,518.4
Subtotal N:	\$0.0	\$2,250.0	\$3,375.0	\$5,062.5	\$6,075.0	\$4,252.5	\$2,976.8	\$2,083.7	\$1,458.6	\$1,021.0	\$28,555.1
Cost Summary:	\$17,197.6	\$26,502.9	\$36,968.7	\$27,761.8	\$21,972.3	\$15,697.3	\$12,709.3	\$6,140.1	\$4,257.5	\$3,874.6	\$173,082.0